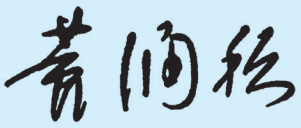
2020

Report on the State of the Ecology and Environment in China

Ministry of Ecology and Environment,
the People's Republic of China

The 2020 Report on the State of the Ecology and Environment in China is hereby released in accordance with the Environmental Protection Law of the People's Republic of China.

Minister of Ecology and Environment,
the People's Republic of China



May 24, 2021

CONTENTS

Summary

The year 2020 was an exceedingly extraordinary year in the history of the People's Republic of China. Under the strong leadership of the Party Central Committee with Comrade Xi Jinping as the core and guided by Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, various localities and departments have earnestly implemented Xi Jinping Thought on Ecological Civilization and put into action the spirits embodied in the 19th National Congress of the Communist Party of China (CPC), the 2nd, 3rd, 4th, and the 5th Plenary Session of the 19th CPC Central Committee. The phased targets of the tough battle of pollution prevention and control have been successfully attained, and nine obligatory targets on ecology and environment defined in the outline of the 13th "Five-Year" Plan have been fulfilled in accordance with the decisions and deployment of the Central Committee of the CPC and the State Council. The people's sense of gain has been significantly enhanced in the area of ecology and environment, and the green development has become a strong support for China to build a moderately prosperous society in an all-around way.

We were resolute in winning the campaign of "Beat Air Pollution". The control of particulate matter ($PM_{2.5}$) and ozone (O_3) has been promoted in a coordinated way, the *2020 Volatile Organic Compounds (VOCs) Control Plan* was issued and five rounds of supervision and assistance have been carried out in the prevention and control of ozone pollution. A total of 33,000 enterprises were identified with problems and 105,000 VOCs-related problems were exposed. The comprehensive control of atmospheric pollution as well as the supervision and assistance in the campaign of "Beat Air Pollution" continued in the autumn and winter season. Coal heating in households has been replaced by clean fuel heating in Beijing-Tianjin-Hebei and surrounding areas as well as FenWei Plain. Dynamic measures were stepped up to eliminate small, poorly-managed polluting enterprises. A total of 39,000 industrial furnaces in the plain areas have been inspected. Ultra-low emission has been achieved of about 950 million kilowatts of coal-fired power generation units. The sixth phase of emission standards for light vehicles has been fully implemented. The open-air burning of straw has been put under strict control, and the comprehensive control of open-pit mines and dust has been promoted. The percentage of days meeting air quality standard increased to 87.0% (84.5% as the target) among cities at or above the prefecture level. Among cities failing to meet air quality standard at or above the prefecture level, the average concentration of $PM_{2.5}$ was 28.8% lower than that in 2015 (18% as the target).

We have enhanced efforts to promote the campaign on "Beat Water Pollution". The construction of centralized drinking water sources has been further regulated and standardized. The delineation of protected areas has been completed in 10,638 water sources with water supply of 1,000

tons or for 10,000 people in rural areas. A total of 39,000 new sewage collection and treatment facilities have been built nationwide. A total of 98.2% black and malodorous water bodies have been eliminated in cities at or above prefecture level. Under the national monitoring program, water sections with the water quality inferior to Grade V standard have all been eliminated in the Yangtze River Basin and rivers flowing into the Bohai Sea. The mainstream of the Yangtze River has achieved 100% good water quality for the first time. A total of 279 "Three Phosphorus" enterprises (mines and tailing ponds) have completed rectification in eleven provinces (cities) along the Yangtze River Economic Belt. The investigation and inspection of sewage outlets in the pilot areas of the Yellow River Basin has been completed, having identified a total of 12,656 sewage outlets of various types. The special law enforcement operation of "Blue Sea 2020" has been carried out. With the implementation of the Integrated Bohai Sea Management Action Plan, ecological restoration of coastal wetlands of 8,891 hectares and coastline renovation of 132 kilometers have been completed. 29 provinces (except Xinjiang and Tibet) have completed county-level plans for rural domestic sewage treatment. The comprehensive improvement of rural environment has been fulfilled in 150,000 administrative villages during the 13th "Five-Year" Plan period. The protection of groundwater ecological environment has been advanced and the anti-seepage transformation of underground oil tanks at gas stations has been completed. The percentage of sections with good surface water quality increased to 83.4% (70% as the target), while that inferior to Grade V water quality standard decreased to 0.6% (5% as the target).

We have steadily promoted the campaign on "Beat Soil Pollution". We had achieved the safe utilization rate of about 90% of the contaminated cultivated land and more than 90% of the contaminated land plots, exceeding the goals set in the *Soil Pollution Prevention and Control Action Plan*. The law enforcement inspection of *The Soil Pollution Prevention and Control Law* has been completed and the preliminary sampling and investigation of all plots with soil pollution have been completed among key industries and enterprises. Pilot projects for the application of soil pollution control and remediation technologies and pilot areas for comprehensive prevention and control of soil pollution have been advanced. The pilot project of "Zero-waste City" has generated a number of replicable and promotable demonstration models. Illegal activities and crimes related to hazardous wastes have been severely cracked down. Special investigation and rectification on the environmental risks of hazardous wastes has been carried out, involving a total of 60,000 enterprises and more than 250 chemical parks. The environmental management and registration system for new chemical substances has been improved and *The List of Priority Controlled Chemicals (Second Batch)* has been issued. The pollution control of key tailing ponds

in the Yangtze River Economic Belt has been basically completed. We have exceeded the target of reducing the emissions of key heavy metal pollutants by 10% in key industries and successfully achieved the goal of zero import of solid waste by the end of 2020. All imported solid waste has been completely blocked out of the country.

We have been successful in the overall coordination of the COVID-19 epidemic prevention and control, economic and social development as well as ecological and environmental protection. By adhering to the principle of responsibility in the crucial fight against the COVID-19 epidemic, we have continuously strengthened related environmental supervision and services such as the treatment and disposal of medical wastes and wastewater treatment in key areas, ensuring 100% full coverage of environmental supervision and services in all medical institutions and facilities nationwide and complete implementation of timely and effective collection, treatment and disposal of medical waste and medical wastewater. The disposal capacity of medical wastes in the country increased by nearly 30%, and that in Hubei Province grew by nearly three times. The leading group of the Ministry of Ecology and Environment in response to the COVID-19 epidemic have held 43 meetings and promptly sent working groups to provinces(regions) such as Hubei, Heilongjiang, and Inner Mongolia to supervise, guide, and improve the disposal capacity of medical wastes. The national eco-environmental system has made every effort to coordinate emergency monitoring equipment, medical waste disposal facilities, and protective equipment to support Wuhan and other places in the fight against COVID-19. The country has been strengthening the emergency monitoring of the quality of water at drinking water sources. We issued and implemented *The Guiding Opinions on Overall Planning for Epidemic Prevention and Control and Ecological and Environmental Protection for Economic and Social Development* and *The Opinions on Actively Serving and Implementing "Six Supportive Measures" under the Premise of Normalization of Epidemic Prevention and Control and Resolutely Winning the Battle of Beat Pollution*. The country also implemented "two white lists" for the examination and approval of EIAs as well as supervision of law enforcement. The EIAs of 35,000 construction projects were carried out on the notification-and-commitment basis. More than 84,000 enterprises have been included in the management white lists of law enforcement. More than 326,000 off-site inspections has been carried out. Various localities and departments have assisted all kinds of enterprises more than 198,000 times via telephone and online approaches, greatly facilitating the resumption of work and production as well as accelerating the normalization of economic and social development order.

We have accelerated the promotion of high-quality development. *Key Tasks of Promoting Ecological Environment Protection of The Yellow River Basin in 2020* has been issued. 18 provinces

(cities) began to implement the "Three Lines and One Catalogue" (the ecological protection red line, environmental quality baseline, resource utilization ceiling, and eco-environmental access catalogue), which was written into *The Yangtze River Protection Law* and a number of local regulations. A symposium was held on supporting and serving the green development of private enterprises. The platform of China Ecological & Environmental Technology Transformation has been further improved. Energy-saving and environmental-protecting industries continued to expand and prosper. We have continued to deepen the reforms to streamline administration, delegate powers, and improve regulation and services; we have continued to improve the assessment and approval of "three ledger accounts" for major national, local, and foreign investment projects, and implemented list-based management. *The Catalogue of Construction Projects upon the Approval of Environmental Impact Assessment Documents by the Ministry of Ecology and Environment (2021)* was released, further reducing the number of EIA approvals and greatly reducing the number of projects filed for registration. We have given full play to the advantages of ecological environmental protection in alleviating poverty, successfully lifting Weichang County and Longhua County out of poverty. *The Guiding Opinions on Consolidating the Achievements of Poverty Alleviation through Ecological Revitalization and Further Promoting Rural Revitalization (2020-2022)* was also issued.

We have actively responded to climate change. We have implemented President Xi Jinping's major declaration on carbon peak and carbon neutrality. According to preliminary calculation, the intensity of carbon dioxide emissions per unit of GDP in 2020 was 18.8% lower than that in 2015, exceeding the target of 18% set in the 13th "Five-Year" Plan. China has initiated the preparation of the action plan to stop the growth of carbon emission by 2030, continued to improve the national carbon market system and sped up the legislative process of *The Regulations for the Administration of Carbon Emissions Trading*. Institutional documents such as *The Measures for Administration of Carbon Emissions Trading (for Trial Implementation)* and *The Implementation Plan for National Carbon Emissions Trading Quotas and Allocation 2019-2020 (Power Generation Industry)* were issued. The first implementation cycle of the national carbon emissions trading market was officially launched, and the power industry was included in the first batch. A coordinated, optimized, and efficient work system for coordinating and strengthening work related to climate change and eco-environmental protection has been established. We have also actively participated in and promoted the multilateral process of tackling climate change and carried out in-depth South-South cooperation in response to climate change.

We have vigorously promoted the protection of the eco-environment. China actively prepared for hosting the 15th Conference of Parties to the Convention on Biological Diversity and

promoted the negotiation process of the "Post 2020 Global Biodiversity Framework". An online ministerial round table meeting on biodiversity was organized which was attended by ministers of 17 countries and representatives of international organizations to support the successful holding of the United Nations Summit on Biodiversity. The construction of the "53111" supervision system of ecological protection has been studied. The survey and assessment of the national ecological state from 2015 to 2020 was carried out, and *The Opinions on Strengthening Supervision of Ecological Protection* and *Interim Measures for Supervision of Ecological Environment in Nature Reserves* were issued. We have established a supervision system for the ecological environment of nature reserves and continued to carry out the initiative of "Green Shield" on the supervisions of nature protected areas. We have organized the selection and naming of the 4th batch of 87 national ecological demonstration cities and counties as well as 35 innovation bases for practicing the notion of "clear waters and green mountains are invaluable assets", and selected and honored the "Green China Persons of the Year 2018-2019".

We have strengthened the law enforcement and inspection of ecological and environmental protection. The second batch of the second round of ecological and environmental protection inspection has been kicked off by the central government. Supervision and inspection has been carried out in three provinces (cities) and two state-owned enterprises at the central level. Pilot supervision and inspection have been carried out in two departments by means of exploratory supervision, and more than 10,500 cases of public reports have been handled or forwarded. Provincial supervision institutions have been set up across 31 provinces as well as the Xinjiang Production and Construction Corps. The production of the 2020 ecological environment film featuring the Yangtze River Economic Belt was finished. A total of 169 lists of problems have been compiled and 283 out of the 315 problems disclosed in 2018 and 2019 have been rectified. All of the 494 waste incineration-based power plants across the country have completed "installation, displaying, and networking" and released automatic monitoring data, taking the lead in achieving stable up-to-the standard emission in the whole industry. The system of "double randomness, one publicity" was fully implemented, namely selecting inspection targets and inspectors on a random basis, and publicizing investigation results to the public in a timely manner, which concluded law enforcement inspections of 587,400 enterprises. Administrative punishment have been metered out over 126,100 cases nationwide with the amount of the fine totaling 8.236 billion yuan. *The Administrative Measures for Clothing and Logos of Administrative Law Enforcement* was issued, and the reward system for reporting was fully implemented. Large-scale drills for law enforcement of ecological environment protection has been organized and carried out throughout the country in

2020. The Ministry of Ecology and Environment has set up a leading group for handling complaint and reporting, integrating complaint and reporting management agencies, and providing and transferring nearly 200,000 clues for various follow-up special operations in 2020.

We have deepened the reform in the field of ecology and environment. The General Office of the CPC Central Committee and the General Office of the State Council issued *The Guiding Opinions on the Construction of Modern Environmental Governance System* and *The List of Responsibilities for Eco-Environmental Protection of the Central and State Organs and Related Departments*. The General Office of the State Council issued *The Guidance Catalogue of Comprehensive Administrative Law Enforcement Matters for Ecological and Environmental Protection (2020 Edition)*. 31 provincial people's governments and the Xinjiang Production and Construction Corps have issued implementation plans for comprehensive administrative law enforcement reform of ecological and environmental protection. The law enforcement responsibilities have been basically integrated together. The reform of the vertical management system for monitoring and supervising law enforcement ecological and environmental institutions below the provincial level has been basically completed, with its organization adjustment and functioning in accordance with the new system. The preliminary construction of the compensation system for eco-environmental damage has been completed. In 2020, more than 2,700 compensation cases have been handled nationwide, involving more than 5.3 billion yuan in compensation. The full coverage of pollution permits for fixed sources has been realized, approving and issuing 337,700 pollution permits, issuing 31,500 notices for rectification within a given time as well as 2.3652 million pollution permit registration forms.

We have effectively prevented and defused eco-environmental risks of all kinds. The capacity to respond to environmental emergencies has been strengthened. In 2020, a total of 208 environmental emergencies occurred nationwide. Major and sensitive incidents including the "March the 28th" tailing pond leakage and secondary environmental emergency of Heilongjiang Yichun Luming Mining Co. Ltd. have been properly handled. 441,000 cases reported by the public have been received and dealt with, with an on-schedule completion rate of 100%. We have attached great importance to nuclear and radiation safety supervision. The country's nuclear safety coordination mechanism operated efficiently with 235 newly installed state-controlled air automatic monitoring stations for radiation environment. A national experience feedback system for nuclear power plants has been established and operated effectively. We have also accelerated the decommissioning of aging nuclear facilities. A total of 49 operating nuclear power units and 19 civil nuclear research reactors (critical assembly) have constantly maintained a good record

of safe operation. The construction quality of 15 nuclear power units in construction were under strict scrutiny. Radiation incidences from radioactive sources remained at an all-time low, with an accident rate of less than 1 per 10,000 radioactive sources per year.

We have strengthened various safeguarding measures for eco-environmental protection. *The Protection Law of the Yangtze River* and *The Bio-security Law* have been formulated. The revision of *The Law on the Prevention and Control of Environmental Pollution by Solid Wastes* has been completed. The revision of *The Marine Environmental Protection Law*, *The Law on Prevention and Control of Environmental Noise Pollution*, and *The Environmental Impact Assessment Law* have been actively advanced. Eight departmental rules and regulations have been formulated and revised, and 122 national eco-environmental standards have been issued. We have actively promoted the eco-environmental bench-marking work and issued three national benchmarks. 31 rules and regulations and normative documents have been abolished. Ambient air monitoring of VOCs in key areas has been deployed with on-the-move VOCs monitoring carried out on a frequent basis. We have promoted the establishment of an atmospheric photochemical monitoring network and continued to promote the networking and sharing of environmental monitoring data across the country. Monitoring of sewage outlets into the river and the sea has been carried out. 667 automatic water quality stations on trans-boundary sections have been built in the Yangtze River Economic Belt. *The National Surface Water Monitoring and Evaluation Program during the 14th "Five-Year" Plan Period (Trial)* has been issued. The second national survey of pollution sources has been successfully completed. In 2020, a total of 52.3 billion yuan of eco-environmental funds had been allocated by the central government. The National Green Development Fund was officially established. The key project on the causes and control of heavy air pollution has been successfully concluded. The National Water Pollution Control and Treatment Science and Technology Major Project has been pushed forward in an in-depth manner, with its supporting role starting to emerge. In-depth advancement has been made of the joint study on the protection and restoration of the ecological environment of the Yangtze River. The construction of an information platform for integrated eco-environmental management was sped up, achieving the integrated display of big data information. The preparation and formulation of the eco-environmental protection plan and special plans for the 14th "Five-Year" Plan was well underway. The BRI Green Development Institute has been set up to continue to promote the implementation of the Green Silk Road Envoys Program. The China-Africa Environmental Cooperation Center was launched. A seminar on in-depth study and implementation of President Xi Jinping's thoughts on ecological civilization in 2020 was held. Routine press releases was further promoted. The national special event of "June the 5th" World

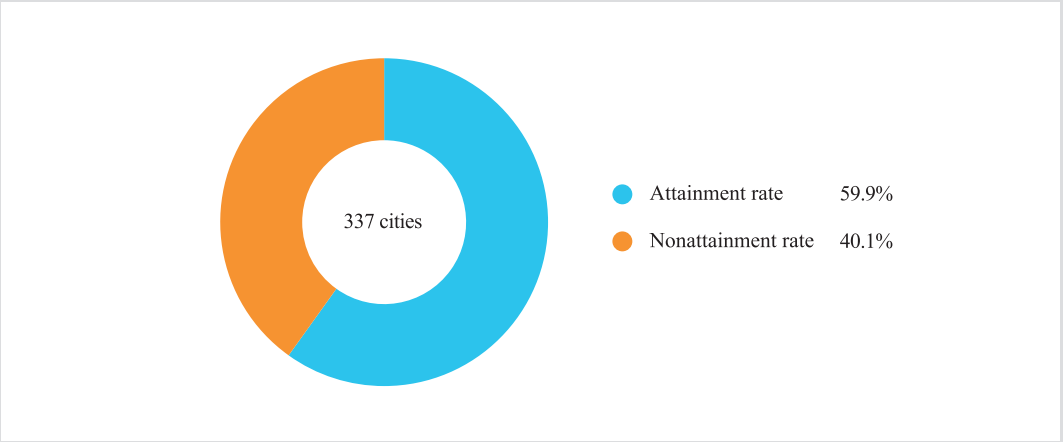
Environment Day had been successfully held. *The Action Plan for Promoting Citizens' Awareness of Ecological Civilization (2021-2025) – "Act for A Beautiful China"* has been completed. We continued to promote the opening of environmental protection facilities to the public and encouraged environmental protection social organizations to actively participate in ecological and environmental protection.

The overall quality of the ecological environment has improved in 2020. The green and low-carbon way of production and lifestyle has been enhanced and the total discharge of major pollutants has been greatly reduced. Environmental risks and loss of biodiversity have been kept at bay. As a result, the stability of the ecosystem has been significantly enhanced and the ecological protective barriers have been put in place. Great progress has been made in modernizing the national governance system and capacity in the field of ecology and environment. The ecological progress has advanced in line with the goal of building a moderately prosperous society in an all-around way.

Atmospheric Environment

Air quality across China*

Overall status In 2020, out of all the 337 cities at or above prefecture-level (APL cities)** (hereinafter referred to as the 337 cities) across the country, 202 cities met national air quality standard***, accounting for 59.9% of the total, an increase of 13.3 percentage points from 2019; 135 cities failed to meet national air quality standard, taking up 40.1%****, a decrease of 13.3 percentage points from 2019. If the impact of dust was not excluded, among the 337 cities, 56.7% cities met national air quality standard, while 43.3% cities failed to meet national air quality standard.



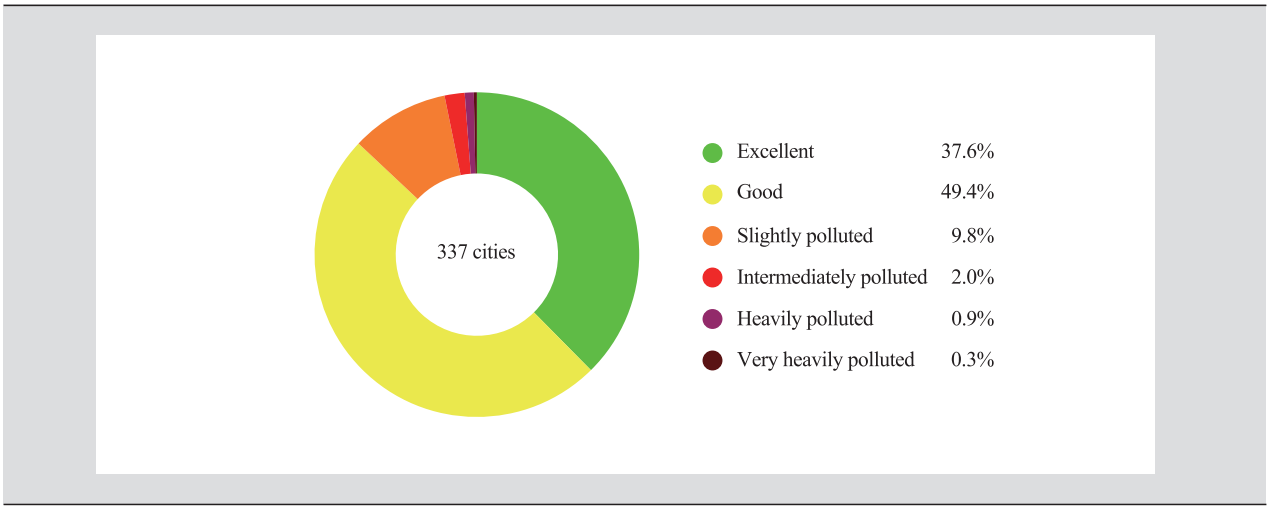
Air quality of 337 cities in 2020

*The real-time (reference status) data are used for air quality assessment in cities.

**Cities at or above prefecture level (APL cities): including municipality, cities or regions at prefecture level, autonomous prefectures and league.

***Air quality meeting the standard: the ambient air quality meets the standard when the concentrations of all 6 pollutants under assessment meet the standard, among which, $PM_{2.5}$, PM_{10}, SO_2 and NO_2 were evaluated according to the annual average concentration, and O_3 and CO were evaluated according to the percentile concentration. According to the *Technical Regulation for Ambient Air Quality Assessment (Trial) (HJ 663-2013)*, effective daily maximum 8-hour average concentration of O_3 and 24-hour average concentration of CO in the calendar year are ranked from small to big, then the percentile value at 90% with the daily maximum 8-hour average concentration of O_3 is compared with the daily maximum 8-hour average concentration of O_3 of national standard date to judge if O_3 concentration meets the standard; and the percentile value at 95% with the 24-hour average concentration of CO is compared to the standard 24-hour CO concentration limit to judge if CO concentration meets the standard.

****The calculation of the percentage of all categories and grades in this report is based on the number of items divided by the total number. The results are revised according to the *Representation and Judgment of Numerical Rounding Rules and Limit Values (GB/T 8170-2008)*, consequently there may arise the situation where the combined proportion of two or more categories does not equal the sum of the proportions of the various categories, or the case where the sum of the proportions of all categories does not equal 100% or the sum of the percentage changes from the same period does not equal 0, the same below.



The percentage of days of various air quality standards of 337 cities in 2020

In 2020, the average percentage of days of the 337 cities meeting air quality standard* was 87.0%, an increase of 5.0 percentage points from 2019. In specific, the attainment rate reached 100% for 17 cities, ranged between 80%~100% for 243 cities, 50%~80% for 74 cities and less than 50% for 3 cities. The ratio of average number of days failing to meet the standard** took up 13.0%, among which, the number of days with $PM_{2.5}$, O_3, PM_{10}, NO_2 and SO_2 as the primary*** pollutant took up 51.0%, 37.1%, 11.7%, 0.5% and less than 0.1% respectively. There was no occurrence of nonattainment days with CO as the primary pollutant.

In 337 cities, 345 accumulative days were under very heavy pollution, 107 days less than that of 2019; 1,152 days were under heavy pollution, 514 days less than that of 2019. Among them, days with $PM_{2.5}$, PM_{10} and O_3 as the primary pollutant took up 77.7%, 22.0% and 1.5% respectively. There was no occurrence of heavy or very heavy pollution with SO_2, NO_2 and CO as the primary pollutant.

Percentage of 337 cities of various standards of six major pollutants in 2020

Indicator	Standard Ⅰ (%)	Standard Ⅱ (%)	Worse than Standard Ⅱ (%)
$PM_{2.5}$	5.0	57.9	37.1
PM_{10}	23.7	53.1	23.1
O_3	3.0	80.4	16.6
SO_2	97.0	3.0	0
NO_2	98.2 (same for Standard Ⅰ & Standard Ⅱ)		1.8
CO	100.0 (same for Standard Ⅰ & Standard Ⅱ)		0

*The number of attainment days: It refers to the number of days with air quality index (AQI) ranging from 0~100, also referred to as attainment days. The impact of sand and dust is not excluded when calculating the number of attainment days.

**The amount of nonattainment days: the number of days with AQI > 100. Among them, AQI within the range of 101~150 indicates slight pollution, 151~200 indicates intermediate pollution, 201~300 indicates heavy pollution and > 300 very heavy pollution. The impact of sand and dust is not excluded when calculating the number of nonattainment days.

***Primary pollutant: When AQI > 50, the pollutant with the biggest individual AQI is the primary pollutant.

Concentrations of six major pollutants in 337 cities in 2020 and interannual comparison

Six major pollutants The concentration of $PM_{2.5}$, PM_{10}, O_3, SO_2, NO_2 and CO were 33 μg/m^3, 56 μg/m^3, 138 μg/m^3, 10 μg/m^3, 24 μg/m^3 and 1.3 mg/m^3 respectively. Compared with that of 2019, the concentration of six major pollutants has all decreased. If the impact of dust was not excluded, the average concentrations of $PM_{2.5}$ and PM_{10} were 33 μg/m^3 and 59 μg/m^3, a decrease of 10.8% and 11.9% from 2019 respectively.

The average concentration of $PM_{2.5}$ in nonattainment APL cities was 37 μg/m^3, a decrease of 7.5% and 28.8% from 2019 and 2015 respectively.

The percentage of nonattainment days for $PM_{2.5}$, O_3, PM_{10}, NO_2, SO_2 and CO were 6.8%, 4.9%, 2.6%, 0.4%, less than 0.1% and less than 0.1% respectively. Compared with that of 2019, the ratio of nonattainment days for SO_2 and CO remained the same, and that for the other four pollutants all decreased.

Percentage of nonattainment days of six major pollutants in 337 cities in 2020 and interannual comparison

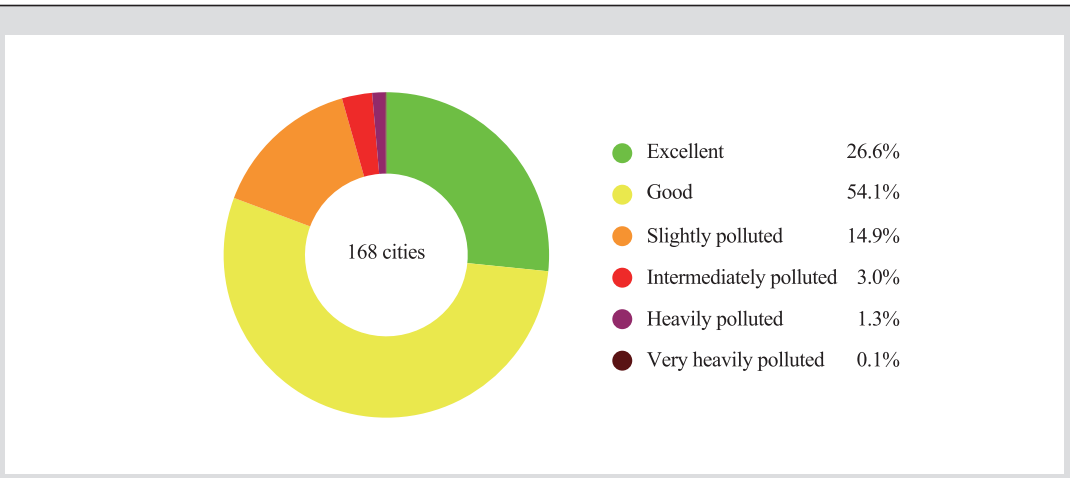
168 Cities

Overall status In 2020, the average percentage of days meeting air quality standard of the 168 cities at or above prefecture level* (hereinafter referred to as 168 cities) was 80.7%, an increase of 8.0 percentage points from 2019. In specific, the attainment rate reached 100% for 2 cities, between 80%~100% for 101 cities, between 50%~80% for 64 cities and less than 50% for 1 city. The average ratio of days failing to meet air quality standard was 19.3%, and the nonattainment days with $PM_{2.5}$, O_3, PM_{10}, NO_2 and SO_2 as the primary pollutant accounted for 51.3%, 43.1%, 5.0%, 0.6% and less than 0.1% of the total number of days exceeding the standard respectively. There was no occurrence of nonattainment days with CO as the primary pollutant.

The evaluation results of comprehensive air quality index** shown that the top 20 cities with relatively good urban air quality included Haikou, Lhasa and Zhoushan, and the bottom 21 cities with relatively bad urban air quality included Anyang, Shijiazhuang and Taiyuan (two cities were juxtaposed as seventeenth and twentieth of the bottom).

Six major pollutants The average concentration of $PM_{2.5}$, PM_{10}, O_3, SO_2, NO_2 and CO were 39 μg/m^3, 64 μg/m^3, 154 μg/m^3, 10 μg/m^3, 30 μg/m^3 and 1.3 mg/m^3 respectively. Compared with that of 2019, the concentration of six major pollutants has all decreased. If the impact of dust was not excluded, the average concentrations of $PM_{2.5}$ and PM_{10} were 39 μg/m^3 and 66 μg/m^3, a decrease of 11.4% and 13.2% from 2019 respectively.

The percentage of nonattainment days for $PM_{2.5}$, O_3, PM_{10}, NO_2, SO_2 and CO were 10.1%, 8.4%, 3.9%, 0.6%, less than 0.1% and less than 0.1% respectively. Compared with that of 2019, the nonattainment days for SO_2 kept the same, and that for other five pollutants all decreased.



The percentage of days of various air quality standards of 168 cities in 2020

*Including key regions such as Beijing-Tianjin-Hebei and surrounding areas, the Yangtze River delta region, the Fenwei Plain, Chengdu-Chongqing region, the middle reaches of the Yangtze River, the Pearl River delta region, and provincial capital cities and cities under separate plan of the State Council.

**Comprehensive air quality index: The sum of the quotients of concentration of the 6 air pollutants against corresponding Grade II limit within the assessment period is the comprehensive air quality index of the current city in that period, which is employed for the ranking of urban air quality.

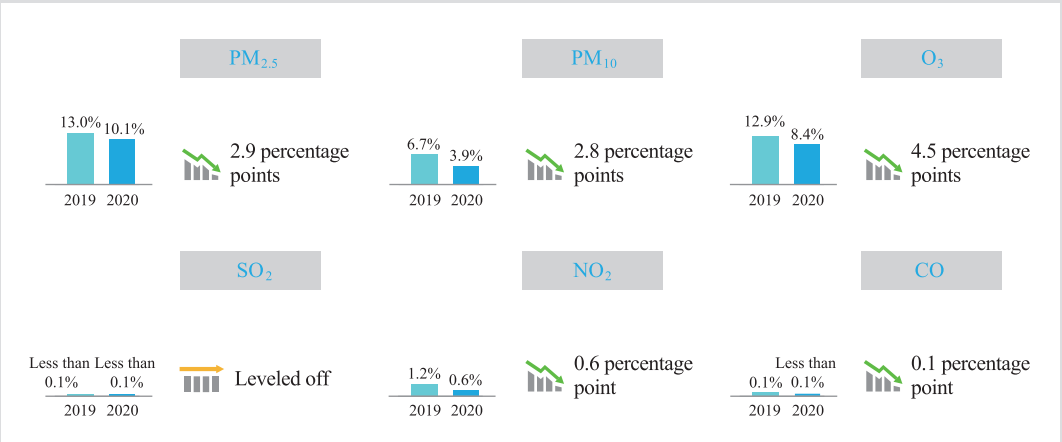
Top/bottom 20 of 168 cities in air quality ranking in 2020

Rank	City	Rank	City
Top 1	Haikou	Bottom 1	Anyang
Top 2	Lhasa	Bottom 2	Shijiazhuang
Top 3	Zhoushan	Bottom 3	Taiyuan
Top 4	Xiamen	Bottom 4	Tangshan
Top 5	Huangshan	Bottom 5	Handan
Top 6	Shenzhen	Bottom 6	Linfen
Top 7	Lishui	Bottom 7	Zibo
Top 8	Fuzhou	Bottom 8	Xingtai
Top 9	Huizhou	Bottom 9	Hebi
Top 10	Guiyang	Bottom 10	Jiaozuo
Top 11	Zhuhai	Bottom 11	Jinan
Top 12	Ya'an	Bottom 12	Zaozhuang
Top 12	Taizhou	Bottom 13	Xianyang
Top 14	Zhongshan	Bottom 14	Yuncheng
Top 15	Zhaoqing	Bottom 15	Weinan
Top 16	Kunming	Bottom 16	Xinxiang
Top 17	Nanning	Bottom 17	Baoding
Top 18	Suining	Bottom 17	Yangquan
Top 19	Zhangjiakou	Bottom 19	Liaocheng
Top 20	Dongguan	Bottom 20	Binzhou
——	——	Bottom 20	Jincheng

Percentage of 168 cities of various standards of six major pollutants in 2020

Indicator	Standard Ⅰ (%)	Standard Ⅱ (%)	Worse than Standard Ⅱ (%)
$PM_{2.5}$	1.2	36.9	61.9
PM_{10}	8.9	52.4	38.7
O_3	0	66.7	33.3
SO_2	97.6	2.4	0
NO_2	96.4 (same for Standard Ⅰ & Standard Ⅱ)		3.6
CO	100.0 (same for Standard Ⅰ & Standard Ⅱ)		0

Concentrations of six major pollutants in 168 cities in 2020 and interannual comparison



Percentage of nonattainment days of six major pollutants in 168 cities in 2020 and interannual comparison

Key Regions

Beijing-Tianjin-Hebei and surrounding areas* In 2020, the ratio of the number of days of "2+26" cities in Beijing-Tianjin-Hebei and surrounding areas of the whole year meeting air quality standard fell within the range of 49.5%~75.4% with the average rate of 63.5%, up by 10.4 percentage points compared with that of 2019. In specific, the

*Including Beijing, Tianjin, Shijiazhuang, Tangshan, Handan, Xingtai, Baoding, Cangzhou, Langfang and Hengshui in Hebei province, Taiyuan, Yangquan, Changzhi and Jincheng in Shanxi Province, Jinan, Zibo, Jining, Dezhou, Liaocheng, Binzhou and Heze in Shandong Province, Zhengzhou, Kaifeng, Anyang, Hebi, Xinxiang, Jiaozuo and Puyang in Henan Province, collectively referred to as the "2+26" cities.

share of attainment days took up 50%~80% for 27 cities and less than 50% for 1 city. The average number of nonattainment days accounted for 36.5% of the total; 26.7%, 6.3%, 3.3% and 0.2% of which was of slight pollution, intermediate pollution, heavy pollution and very heavy pollution respectively. The share of heavy pollution days and above decreased by 2.0 percentage points from 2019. Among the nonattainment days, the number of days with $PM_{2.5}$, O_3, PM_{10} and NO_2 as the primary pollutant took up 48.0%, 46.6%, 5.3% and 0.2% respectively. There was no occurrence of nonattainment days with SO_2 and CO as the primary pollutant.

The percentage of the number of attainment days was 75.4% for Beijing, up by 9.6 percentage points compared with that of 2019. There were 10 days of heavy pollution, no occurrence of very heavy pollution, and the number of days under heavy pollution and above was 6 days more than that of 2019 and 33 days less than that of 2015.

The Yangtze River delta* In 2020, 41 cities witnessed 70.2%~99.7% share for the number of attainment days throughout the year with the average ratio of 85.2%, up by 8.7 percentage points compared with that of 2019. In specific, the attainment days took up 80%~100% for 34 cities and 50%~80% for 7 cities. The average number of nonattainment days accounted for 14.8% of the total; 12.3%, 2.0% and 0.5% of which was of slight pollution, intermediate pollution and heavy pollution respectively, and the number of days under heavy pollution and above was down by 0.1 percentage point compared with that of 2019. Among the nonattainment days, the number of days with O_3, $PM_{2.5}$, PM_{10} and NO_2 as the primary pollutant took up 50.7%, 45.1%, 2.9% and 1.4% respectively. There was no occurrence of nonattainment days with SO_2 and CO as the primary pollutant.

The percentage of the number of attainment days was 87.2% for Shanghai around the year, up by 2.5 percentage points compared with that of 2019. There was 1 day under heavy pollution and no occurrence of day under very heavy pollution. The number of days under heavy pollution and above remained the same as that of 2019 and was 7 days less than that of 2015.

Fenwei Plain** The percentage of the number of attainment days of 11 cities in Fenwei Plain was within the range of 61.5%~82.8% with the average rate of 70.6%, up by 8.9 percentage points compared with that of 2019. In specific, the attainment rate was within the range of 80%~100% for 1 city, and 50%~80% for 10 cities. The average ratio of nonattainment days was 29.4%; 22.0% of which were of

The concentration of six major pollutants in Beijing–Tianjin–Hebei and surrounding areas in 2020 and interannual comparison

Region	Indicator	Concentration Unit	Concentration	Change compared with that of 2019 (%)
Beijing-Tianjin-Hebei and surrounding areas	$PM_{2.5}$	$\mu g/m^3$	51	-10.5
	PM_{10}	$\mu g/m^3$	87	-13.0
	O_3	$\mu g/m^3$	180	-8.2
	SO_2	$\mu g/m^3$	12	-20.0
	NO_2	$\mu g/m^3$	35	-12.5
	CO	mg/m^3	1.7	-15.0
Beijing	$PM_{2.5}$	$\mu g/m^3$	38	-9.5
	PM_{10}	$\mu g/m^3$	56	-17.6
	O_3	$\mu g/m^3$	174	-8.9
	SO_2	$\mu g/m^3$	4	0
	NO_2	$\mu g/m^3$	29	-21.6
	CO	mg/m^3	1.3	-7.1

*Including Shanghai municipality, Jiangsu, Zhejiang and Anhui province.

**Including Jinzhong, Yuncheng, Linfen and Lvliang in Shanxi Province, Luoyang and Sanmenxia in Henan Province, and Xi'an, Tongchuan, Baoji, Xianyang, and Weinan in Shaanxi Province.

slight pollution, 4.6% of intermediate pollution, 2.6% of heavy pollution and 0.2% of very heavy pollution, and the number of days under heavy pollution and above was down by 3.2 percentage points compared with that of 2019. Among the nonattainment days, the number of days with $PM_{2.5}$, O_3, PM_{10} and NO_2 as the primary pollutant took up 56.4%, 36.1%, 7.3% and 0.2% respectively. There was no occurrence of nonattainment days with CO and SO_2 as the primary pollutant.

The concentration of six major pollutants in the Yangtze River delta region in 2020 and interannual comparison

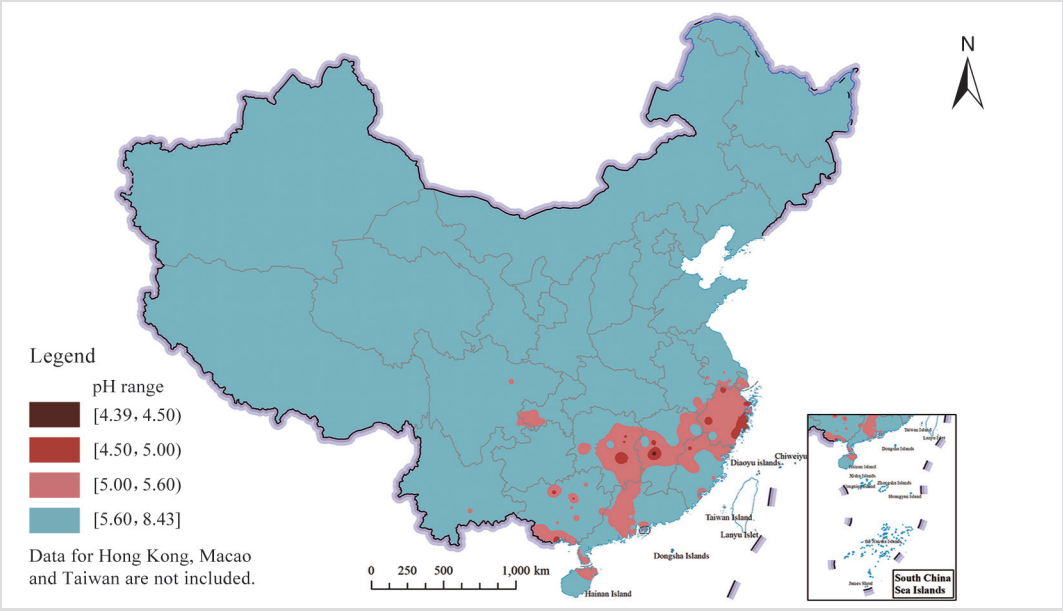
Region	Indicator	Concentration Unit	Concentration	Change compared with that of 2019 (%)
The Yangtze River delta region	$PM_{2.5}$	$\mu g/m^3$	35	-14.6
	PM_{10}	$\mu g/m^3$	56	-13.8
	O_3	$\mu g/m^3$	152	-7.3
	SO_2	$\mu g/m^3$	7	-22.2
	NO_2	$\mu g/m^3$	29	-9.4
	CO	mg/m^3	1.1	-8.3
Shanghai	$PM_{2.5}$	$\mu g/m^3$	32	-8.6
	PM_{10}	$\mu g/m^3$	41	-8.9
	O_3	$\mu g/m^3$	152	0.7
	SO_2	$\mu g/m^3$	6	-14.3
	NO_2	$\mu g/m^3$	37	-11.9
	CO	mg/m^3	1.1	0

The concentration of six major pollutants in Fenwei Plain in 2020 and interannual comparison

Region	Indicator	Concentration Unit	Concentration	Change compared with that of 2019 (%)
Fenwei Plain	$PM_{2.5}$	$\mu g/m^3$	48	-12.7
	PM_{10}	$\mu g/m^3$	83	-11.7
	O_3	$\mu g/m^3$	161	-5.8
	SO_2	$\mu g/m^3$	12	-20.0
	NO_2	$\mu g/m^3$	35	-10.3
	CO	mg/m^3	1.6	-15.8

Acid Rain

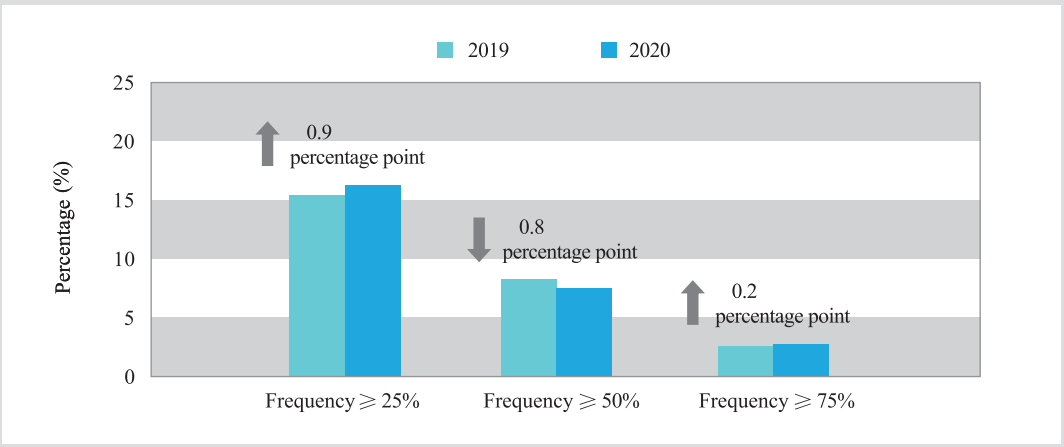
Acid rain distribution In 2020, the total area covered by acid rain was about 466,000 km^2, taking up 4.8% of total land area of China, down by 0.2 percentage point compared with that of 2019. Among them, the percentage of land area with relatively serious acid rain was 0.4%*. Acid rain was mainly distributed in the region south to the Yangtze River and east to Yunnan-Guizhou Plateau, mainly including Zhejiang, most parts of Shanghai, northern part of Fujian, central part of Jiangxi, central and eastern part of Hunan, central part of Guangdong, southern part of Guangxi and southern part of Chongqing.



The isoline of annual pH value of precipitation in China in 2020

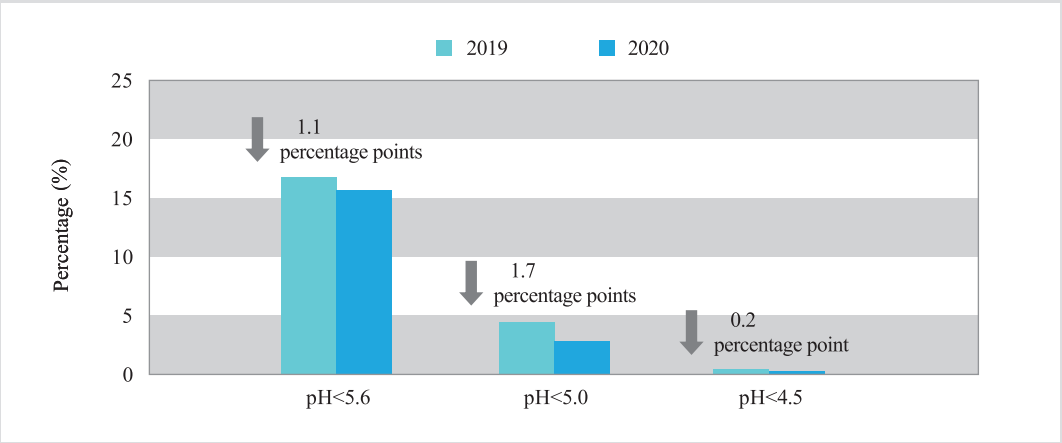
Acid rain frequency In 2020, the average acid rain frequency for 465 cities (districts or counties) under precipitation monitoring was 10.3%, up by 0.1 percentage point compared with that of 2019. The rate of cities with acid rain occurrence was 34.0%, up by 0.7 percentage point compared with that of 2019. The percentage of cities with acid rain frequency over 25%, 50% and 75% was 16.3%, 7.5% and 2.8% respectively.

*The acid rain is defined when the precipitation pH value is below 5.6; relatively serious acid rain is defined when the pH value is below 5.0; serious acid rain is defined when the pH value is below 4.5.



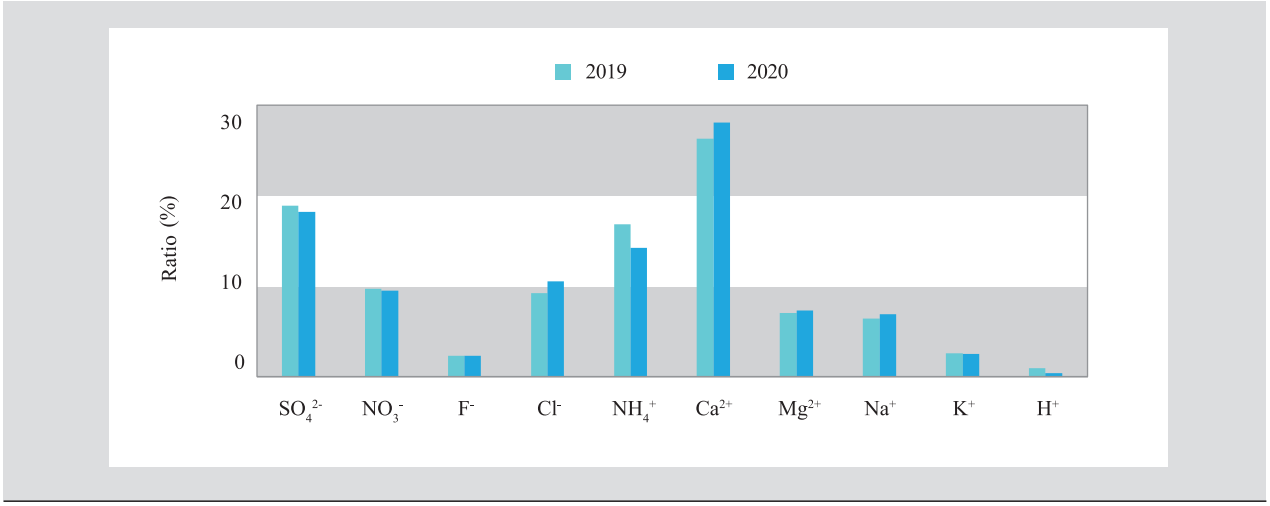
Percentage of cities with different acid rain frequency in 2020 and interannual comparison

Precipitation acidity In 2020, the annual average pH value of precipitation across the country ranged from 4.39 to 8.43 with the average value of 5.60. The rate of cities with acid rain, relatively serious acid rain and serious acid rain was 15.7%, 2.8% and 0.2% respectively.



Percentage of cities with different annual pH value of precipitation in 2020 and interannual comparison

Chemical composition In 2020, the main cations in precipitation were calcium ion and ammonium, with an equivalent concentration ratio of 28.1% and 14.2% respectively. The key anion was sulfate radical with an equivalent concentration ratio of 18.2%, and the equivalent concentration ratio of nitrate radical was 9.5%. In general, the type of acid rain can still be classified as sulfuric acid. Compared with that of 2019, the percentage of concentration of sulfate radical, nitrate radical, ammonium, hydrogen ion and potassium ion went down slightly, while the percentage of concentration of calcium ion, chloride ion, magnesium ion and sodium ion went up a bit, and the percentage of concentration of fluoride ion kept at a stable level.



Main ion equivalent concentration ratio of precipitation in 2020 and interannual comparison

Straw burning

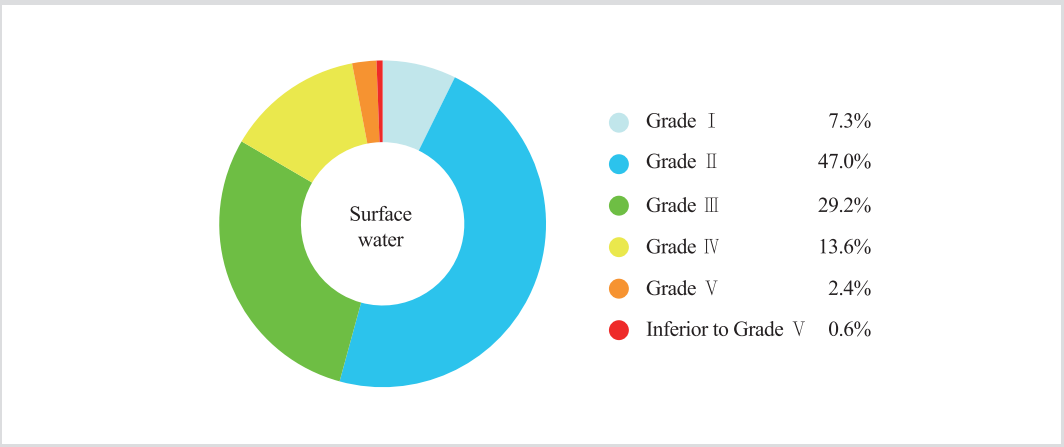
In 2020, satellite remote sensing monitored a total of 7,635 straw burning points in the country (excluding fire point information under cloud cover), mainly distributed in Jilin, Inner Mongolia, Heilongjiang, Liaoning, Shanxi, Hebei, Shandong, Xinjiang, Guangxi, Gansu and Henan provinces (autonomous regions).

Freshwater Environment

Surface waters

In 2020, there were 1,937 surface water sections (sites) under national monitoring program*, among which water sections (sites) meeting Grade I~III water quality standards took up 83.4%, up by 8.5 percentage points compared with that of 2019; sections that are inferior to Grade V standard took up 0.6%, down by 2.8 percentage points compared with that of 2019**. The major pollution indicators were chemical oxygen demand (COD), total phosphorus (TP) and permanganate index.

In 2020, among the APL cities, 30 cities including Liuzhou, Guilin, and Zhangye had relatively good water environment quality of the national surface water assessment sections, and 30 cities including Tongchuan, Cangzhou and Xingtai had relatively poor water environment quality of the national surface water assessment sections.



General surface water quality of China in 2020

*The National Surface Water Environmental Quality Monitoring Network during the 13th "Five-Year" Plan Period has established 1,940 sections for the purpose of evaluating, assessing and ranking the water quality of sections (sites). Among them, a total of 1,937 sections (sites) in 2020 were monitored, and the other 3 were not monitored due to cutoff of flow and traffic.

**21 indicators of Table 1 of *Environmental Quality Standard for Surface Water (GB 3838-2002)* except water temperature, TN and E-coli are employed to assess the water grade based on each individual limit, and the highest grade from the single factor approach is taken as the type of water quality of the section. Grade I or II standard of water refers to the water in Class I protected areas of drinking water sources, habitats of rare aquatic species, fish and shrimp spawning grounds and feeding grounds of fry and young fish. Grade III standard of water could be used for Class II drinking water source protected areas, fish and shrimp wintering grounds, migration channels, aquaculture areas and swimming sites. Grade IV standard of water could be used for general industrial water use and recreation without any direct contact with human body. Grade V standard of water could be used for agriculture and landscape related irrigation, and waters failing to meet Grade V standard hardly has any function except adjustment of local climate.

Top/bottom 30 cities of water environment quality of the national surface water assessment section in 2020

Rank	City	Rank	City
Top 1	Liuzhou	Bottom 1	Tongchuan
Top 2	Guilin	Bottom 2	Cangzhou
Top 3	Zhangye	Bottom 3	Xingtai
Top 4	Jinchang	Bottom 4	Dongying
Top 5	Turpan	Bottom 5	Binzhou
Top 6	Yunfu	Bottom 6	Fuxin
Top 7	Laibin	Bottom 7	Rizhao
Top 8	Qiandongnan Miao and Dong Autonomous Prefecture	Bottom 8	Shangqiu
Top 9	Heyuan	Bottom 9	Huaibei
Top 10	Chongzuo	Bottom 10	Linfen
Top 11	Hechi	Bottom 11	Shenyang
Top 12	Zhaoqing	Bottom 12	Lvliang
Top 13	Panzhihua	Bottom 13	Weifang
Top 14	Yongzhou	Bottom 14	Langfang
Top 15	Guigang	Bottom 15	Liaoyuan
Top 16	Wuzhou	Bottom 16	Tongliao
Top 17	Changji Hui Autonomous Prefecture	Bottom 17	Tianjin
Top 18	Jiayuguan	Bottom 17	Hebi
Top 19	Alxa League (Alashan)	Bottom 19	Panjin
Top 20	Ya'an	Bottom 20	Liaocheng
Top 21	Wenshan Zhuang and Miao Autonomous Prefecture	Bottom 21	Lianyungang
Top 22	Hezhou	Bottom 22	Heze
Top 23	Baise	Bottom 23	Xuzhou
Top 24	Kashgar (Kashi) Prefecture	Bottom 24	Suzhou
Top 25	Qiannan Buyi and Miao Autonomous Prefecture	Bottom 25	Qingdao
Top 26	Shaoyang	Bottom 26	Kaifeng
Top 27	Enshi Tujia and Miao Autonomous Prefecture	Bottom 27	Zibo
Top 28	Huangshan	Bottom 28	Siping
Top 29	Lishui	Bottom 29	Zhoukou
Top 30	Ji'an	Bottom 30	Yuxi

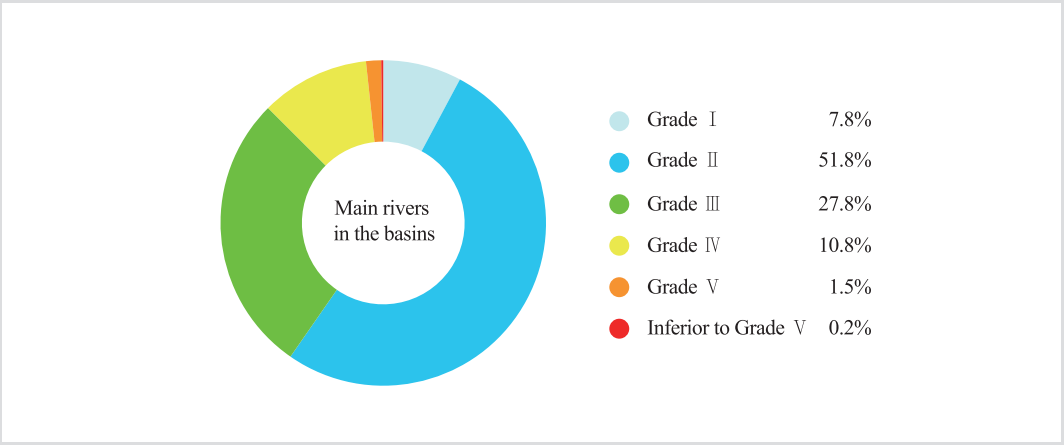
Rivers

Overall status In 2020, out of the 1,614 water sections under national monitoring program in 7 big river basins of the Yangtze River, Yellow River, Pearl River, Songhua River, Huaihe River, Haihe River and Liaohe River as well as rivers in Zhejiang and Fujian, rivers in northwestern and southwestern parts of China*, the water sections of Grade I~III standards took up 87.4%, up by 8.3 percentage points compared with that of 2019; water sections inferior to Grade V standard took up 0.2%, down by 2.8 percentage points compared with that of 2019; The major pollution indicators

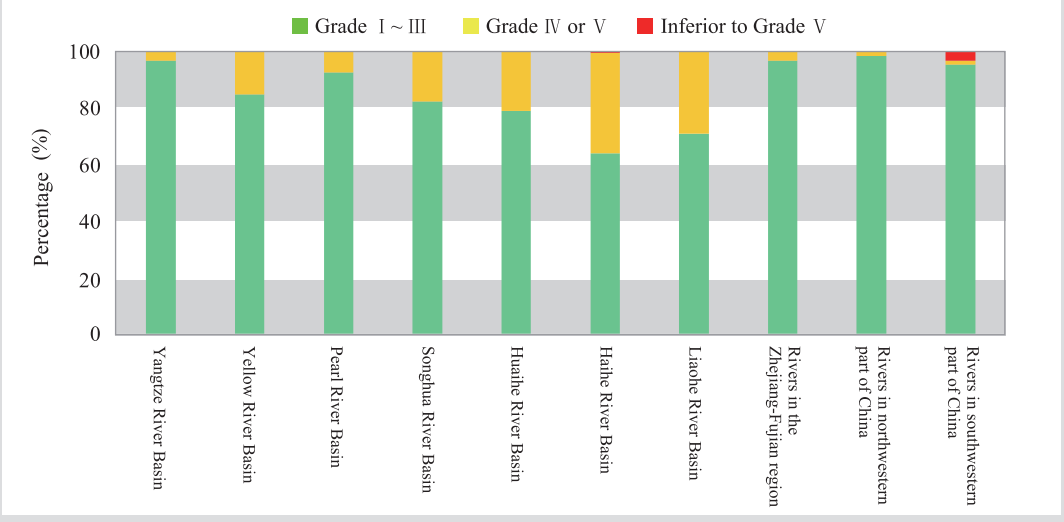
*The surface water quality of river basins refers to the water quality of the main rivers, excluding the lakes (reservoirs) in river basins; the same below.

were COD, permanganate index and BOD_5.

Rivers in northwest China, Zhejiang and Fujian region, river basin of the Yangtze River, rivers in southwest China and in Pearl River basin were of excellent quality. The water quality of the Yellow River, Songhua River, Huaihe River was fairly good, and that of the Liaohe River and Haihe River was slightly polluted.

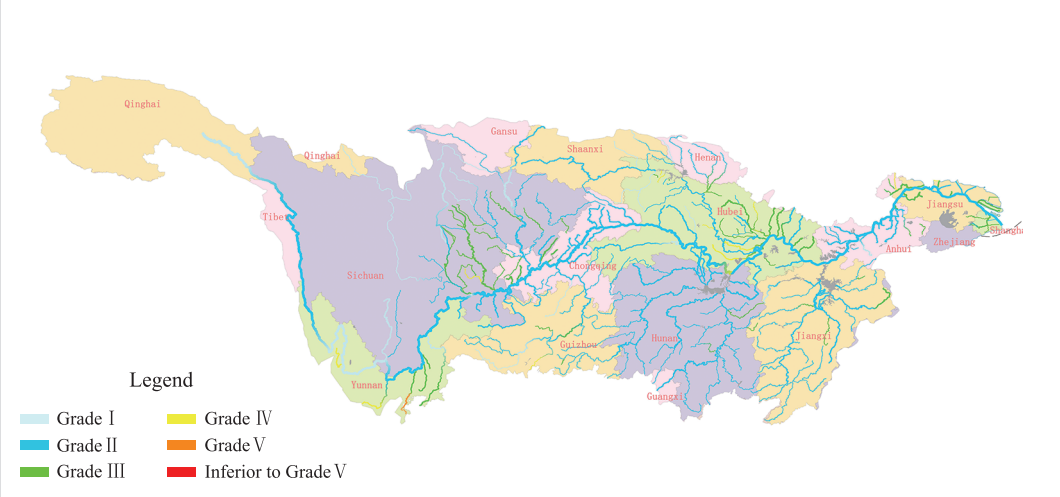


General water quality of river basins of China in 2020



Water quality of 7 big river basins, rivers in Zhejiang and Fujian, rivers in northwestern part and southwestern part of China in 2020

The Yangtze River Basin registered excellent water quality. In all the 510 water sections under national monitoring program, 96.7% met Grade I~III standards, up by 5.0 percentage points compared with that of 2019; no section was inferior to Grade V standard, down by 0.6 percentage point compared with that of 2019. The water quality of the mainstream and major tributaries of the Yangtze River was excellent.



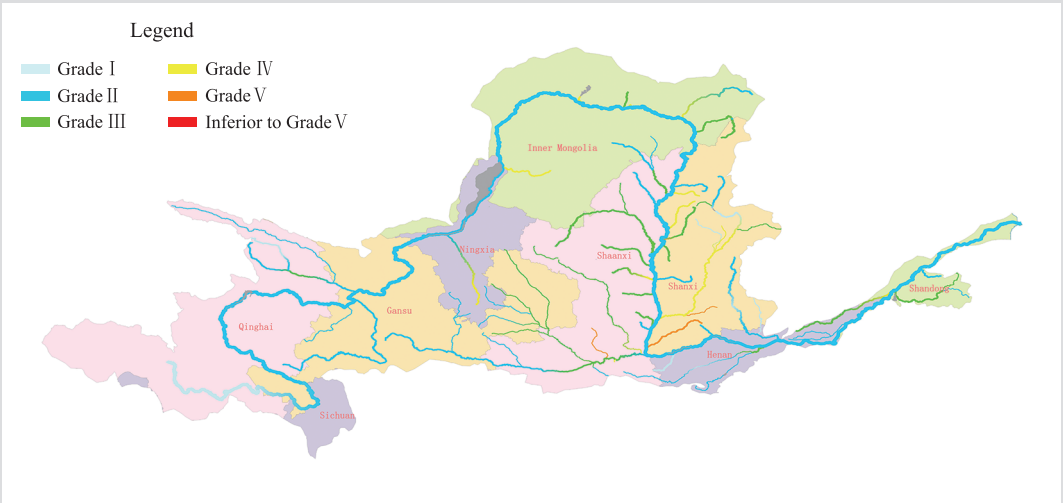
Water quality distribution of Yangtze River Basin in 2020

Water quality of Yangtze River Basin in 2020 and interannual comparison

Water body	Number of sections (items)	Percentage (%)						Compared with that of 2019 (percentage points)					
		Grade Ⅰ	Grade Ⅱ	Grade Ⅲ	Grade Ⅳ	Grade Ⅴ	Inferior to Grade Ⅴ	Grade Ⅰ	Grade Ⅱ	Grade Ⅲ	Grade Ⅳ	Grade Ⅴ	Inferior to Grade Ⅴ
Basin	510	8.2	67.8	20.6	2.9	0.4	0	4.9	0.8	-0.8	-3.8	-0.6	-0.6
Mainstream	59	10.2	89.8	0	0	0	0	3.4	-1.7	-1.7	0	0	0
Major tributaries	451	8.0	65.0	23.3	3.3	0.4	0	5.1	1.2	-0.7	-4.3	-0.7	-0.7
Water sections across provincial boundaries	60	8.3	78.3	13.3	0	0	0	5.0	-3.4	0	-1.7	0	0

The Yellow River Basin was of fairly good water quality. Out of the 137 water sections under national monitoring program, 84.7% met Grade I~III standards, up by 11.7 percentage points compared with that of 2019; no section was

inferior to Grade V standard, down by 8.8 percentage points compared with that of 2019. In specific, the mainstream of the Yellow River was of excellent water quality and the water quality of major tributaries was fairly good.

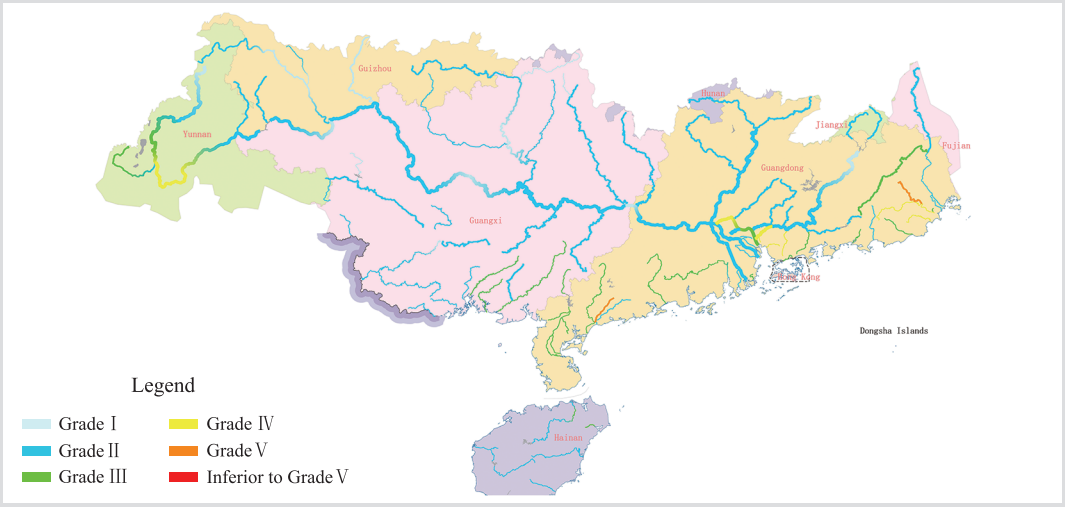


Water quality distribution of Yellow River Basin in 2020

Water quality of Yellow River Basin in 2020 and interannual comparison

Water body	Number of sections (items)	Percentage (%)						Compared with that of 2019 (percentage points)					
		Grade Ⅰ	Grade Ⅱ	Grade Ⅲ	Grade Ⅳ	Grade Ⅴ	Inferior to Grade Ⅴ	Grade Ⅰ	Grade Ⅱ	Grade Ⅲ	Grade Ⅳ	Grade Ⅴ	Inferior to Grade Ⅴ
Basin	137	6.6	56.2	21.9	12.4	2.9	0	3.0	4.4	4.4	0	-2.9	-8.8
Mainstream	31	3.2	96.8	0	0	0	0	-3.3	19.4	-16.1	0	0	0
Major tributaries	106	7.5	44.3	28.3	16.0	3.8	0	4.7	0	10.4	0	-3.7	-11.3
Water sections across provincial boundaries	39	5.1	69.2	7.7	12.8	5.1	0	2.5	12.8	-5.1	2.5	-5.2	-7.7

The Pearl River Basin was of excellent water quality. Among the 165 water sections under national monitoring program, 92.7% met Grade I~III standards, up by 6.6 percentage points compared with that of 2019; no section was inferior to Grade V standard, down by 3.0 percentage points compared with that of 2019. In specific, the mainstream and major tributaries of the Pearl River and the rivers within Hainan Island were all of excellent water quality.

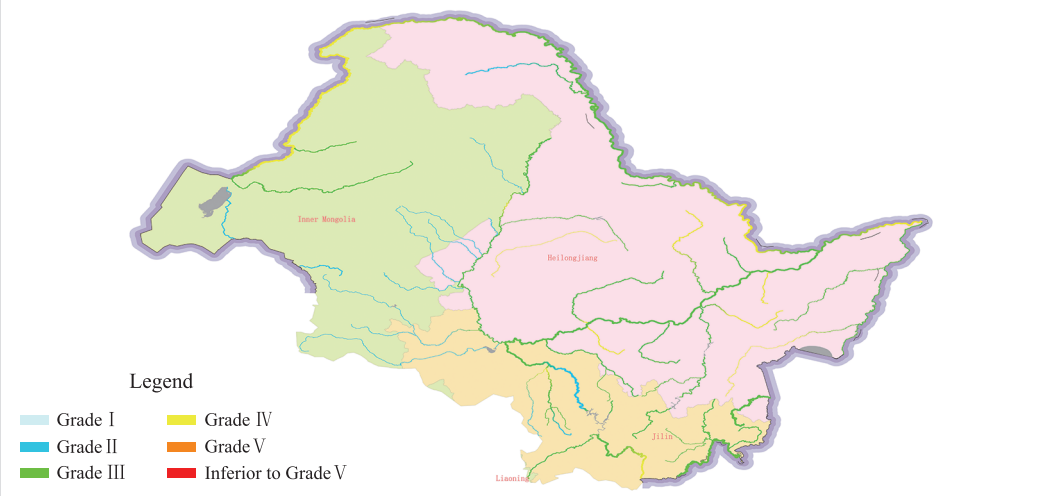


Water quality distribution of Pearl River Basin in 2020

Water quality of Pearl River Basin in 2020 and interannual comparison

Water body	Number of sections (items)	Percentage (%)						Compared with that of 2019 (percentage points)					
		Grade Ⅰ	Grade Ⅱ	Grade Ⅲ	Grade Ⅳ	Grade Ⅴ	Inferior to Grade Ⅴ	Grade Ⅰ	Grade Ⅱ	Grade Ⅲ	Grade Ⅳ	Grade Ⅴ	Inferior to Grade Ⅴ
Basin	165	9.1	67.3	16.4	6.1	1.2	0	5.5	-1.8	3.1	-3.6	0	-3.0
Mainstream	50	10.0	72.0	8.0	10.0	0	0	10.0	-8.0	4.0	-6.0	0	0
Major tributaries	101	9.9	63.4	19.8	5.0	2.0	0	4.0	0	4.0	-2.9	0	-5.0
Rivers within Hainan Island	14	0	78.6	21.4	0	0	0	0	7.2	-7.2	0	0	0
Water sections across provincial boundaries	17	11.8	82.4	5.9	0	0	0	0	0	0	0	0	0

The Songhua River Basin was fairly good in water quality. In all the 108 water sections under national monitoring program, 82.4% met Grade I~III standards, up by 16.0 percentage points compared with that of 2019; no section was inferior to Grade V standard, down by 2.8 percentage points compared with that of 2019. In specific, the mainstream was of excellent water quality, the major tributaries, waters of Tumen River, Wusuli River and Suifen River were of good water quality, and waters of Heilongjiang was slightly polluted.

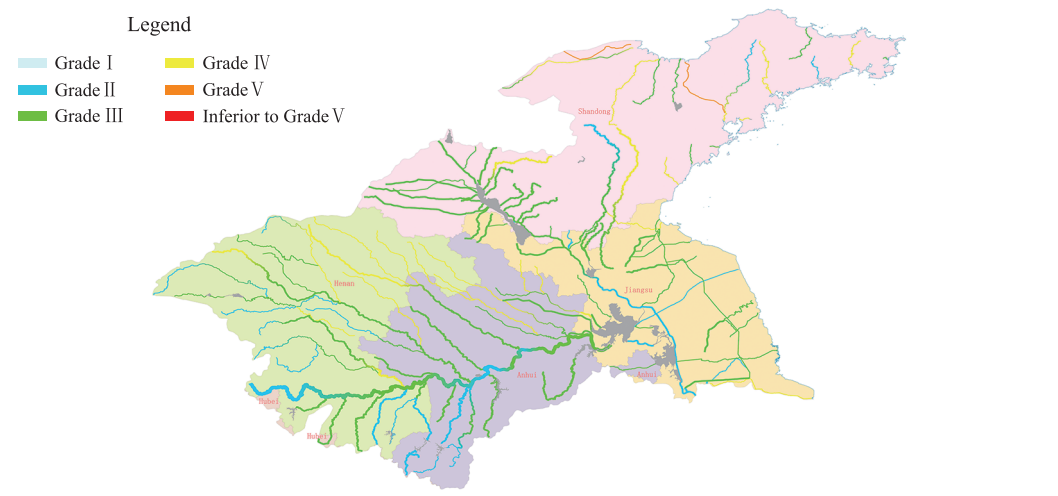


Water quality distribution of Songhua River Basin in 2020

Water quality of Songhua River Basin in 2020 and interannual comparison

Water body	Number of sections (items)	Percentage (%)						Compared with that of 2019 (percentage points)					
		Grade Ⅰ	Grade Ⅱ	Grade Ⅲ	Grade Ⅳ	Grade Ⅴ	Inferior to Grade Ⅴ	Grade Ⅰ	Grade Ⅱ	Grade Ⅲ	Grade Ⅳ	Grade Ⅴ	Inferior to Grade Ⅴ
Basin	108	0	18.5	63.9	17.6	0	0	0	5.4	10.6	-8.6	-4.7	-2.8
Mainstream	17	0	23.5	70.6	5.9	0	0	0	23.5	-17.6	-5.9	0	0
Major tributaries	56	0	25.0	57.1	17.9	0	0	0	3.2	15.3	-5.7	-7.3	-5.5
Waters of Heilongjiang	18	0	11.1	55.6	33.3	0	0	0	0	22.3	-22.3	0	0
Waters of Tumen River	7	0	0	100.0	0	0	0	0	0	14.3	-14.3	0	0
Waters of Wusuli River	9	0	0	77.8	22.2	0	0	0	0	11.1	-11.1	0	0
Waters of Suifen River	1	0	0	100.0	0	0	0	0	0	0	0	0	0
Water sections across provincial boundaries	23	0	47.8	47.8	4.3	0	0	0	4.3	-4.4	0	0	0

The Huaihe River Basin was fairly good in water quality. In 180 water sections under national monitoring program, 78.9% met Grade I~III standards, up by 15.2 percentage points compared with that of 2019; no section was inferior to Grade V standard, down by 0.6 percentage point compared with that of 2019. The mainstream of Huaihe River and Yishu-Si water system were of excellent water quality; and waters of major tributaries of Huaihe River were of good quality; and the waters of rivers flowing into sea in Shandong Peninsula were slightly polluted.



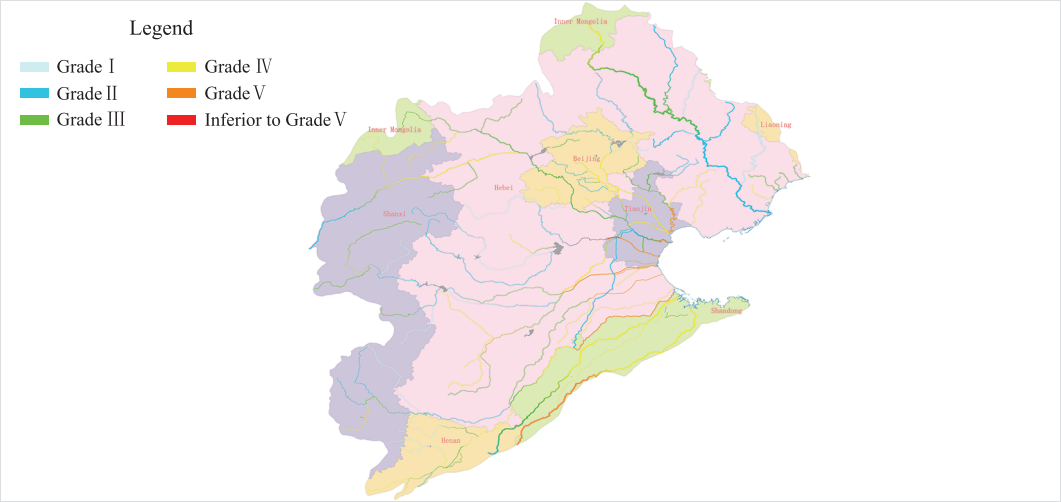
Water quality distribution of Huaihe River Basin in 2020

Water quality of Huaihe River Basin in 2020 and interannual comparison

Water body	Number of sections (items)	Percentage (%)						Compared with that of 2019 (percentage points)					
		Grade Ⅰ	Grade Ⅱ	Grade Ⅲ	Grade Ⅳ	Grade Ⅴ	Inferior to Grade Ⅴ	Grade Ⅰ	Grade Ⅱ	Grade Ⅲ	Grade Ⅳ	Grade Ⅴ	Inferior to Grade Ⅴ
Basin	180	0	20.6	58.3	20.0	1.1	0	-0.6	0.5	15.3	-15.2	0.5	-0.6
Mainstream	10	0	40.0	60.0	0	0	0	0	-50.0	50.0	0	0	0
Major tributaries	101	0	24.8	51.5	23.8	0	0	-1.0	4.0	13.9	-16.8	0	0
Waters of the Yishu-Si water system	48	0	12.5	81.2	6.2	0	0	0	6.3	8.3	-14.6	0	0
Waters of rivers flowing into sea in Shandong Peninsula	21	0	9.5	38.1	42.9	9.5	0	0	-5.5	23.1	-17.1	4.5	-5.0
Water sections across provincial boundaries	30	0	10.0	50.0	40.0	0	0	0	0	6.7	-6.7	0	0

The Haihe River Basin was slightly polluted. The major pollution indicators were COD, permanganate index and BOD_5. In 161 water sections under national monitoring program, 64.0% met Grade I~III standards, up by 12.1 percentage points compared with that of 2019; 0.6% were inferior to Grade V standard, down by 6.9 percentage points compared with that of 2019. In specific, the water quality of 2 sections of the mainstream and Sanchakou met Grade II standard, and the

water quality at Haihe River tidal gate met Grade V standard. The waters of Luanhe River were of excellent quality. The water qualities of major tributaries, the Tuhai River-Majia River and waters in east Hebei and coastal areas were of slight pollution.



Water quality distribution of Haihe River Basin in 2020

Water quality of Haihe River Basin in 2020 and interannual comparison

Water body	Number of sections (items)	Percentage (%)						Compared with that of 2019 (percentage points)					
		Grade Ⅰ	Grade Ⅱ	Grade Ⅲ	Grade Ⅳ	Grade Ⅴ	Inferior to Grade Ⅴ	Grade Ⅰ	Grade Ⅱ	Grade Ⅲ	Grade Ⅳ	Grade Ⅴ	Inferior to Grade Ⅴ
Basin	161	10.6	26.7	26.7	27.3	8.1	0.6	3.7	-2.1	10.5	-0.2	-5.0	-6.9
Mainstream	2	0	50.0	0	0	50.0	0	0	0	0	0	0	0
Major tributaries	125	11.2	25.6	24.8	28.8	8.8	0.8	3.1	3.0	7.9	0.6	-5.7	-8.9
Waters of Luanhe River	17	17.6	47.1	29.4	5.9	0	0	11.7	-23.5	11.8	0	0	0
Waters of Tuhai River-Majia River	11	0	18.2	27.3	45.5	9.1	0	0	-9.1	18.2	0	-9.1	0
Waters in east Hebei and coastal areas	6	0	0	66.7	33.3	0	0	0	-33.3	50.0	-16.7	0	0
Water sections across provincial boundaries	48	10.4	25.0	16.7	37.5	8.3	2.1	-2.4	16.5	-0.3	7.7	-13.0	-8.5

The Liaohe River Basin was of slight pollution. The major pollution indicators were COD, permanganate index and BOD_5. In 103 water sections under national monitoring program, 70.9% met Grade I~III standards, up by 14.6 percentage points compared with that of 2019; no section was inferior to Grade V standard, down by 8.7 percentage points compared with that of 2019. In specific, the waters of Dalinghe River and Yalu River were of excellent quality. The waters of Daliaohe River were of good quality, and the mainstream and major tributaries of Liaohe River were of slight pollution.

Water quality distribution of Liaohe River Basin in 2020

Water quality of Liaohe River Basin in 2020 and interannual comparison

Water body	Number of sections (items)	Percentage (%)						Compared with that of 2019 (percentage points)					
		Grade Ⅰ	Grade Ⅱ	Grade Ⅲ	Grade Ⅳ	Grade Ⅴ	Inferior to Grade Ⅴ	Grade Ⅰ	Grade Ⅱ	Grade Ⅲ	Grade Ⅳ	Grade Ⅴ	Inferior to Grade Ⅴ
Basin	103	3.9	40.8	26.2	27.2	1.9	0	0	2.9	11.6	2.0	-7.8	-8.7
Mainstream	14	0	7.1	14.3	78.6	0	0	0	-7.2	14.3	21.5	-21.4	-7.1
Major tributaries	19	0	5.3	36.8	57.9	0	0	0	-5.2	21.0	21.1	-15.8	-21.1
Waters of Daliaohe River	28	3.6	50.0	21.4	17.9	7.1	0	-3.5	14.3	3.5	0	-3.6	-10.7
Waters of the Daling River	11	0	54.5	36.4	9.1	0	0	0	0	18.2	0	-9.1	-9.1
Waters of the Yalu River	13	7.7	92.3	0	0	0	0	-7.7	7.7	0	0	0	0
Water sections across provincial boundaries	10	0	40.0	20.0	40.0	0	0	0	0	20.0	10.0	-20.0	-10.0

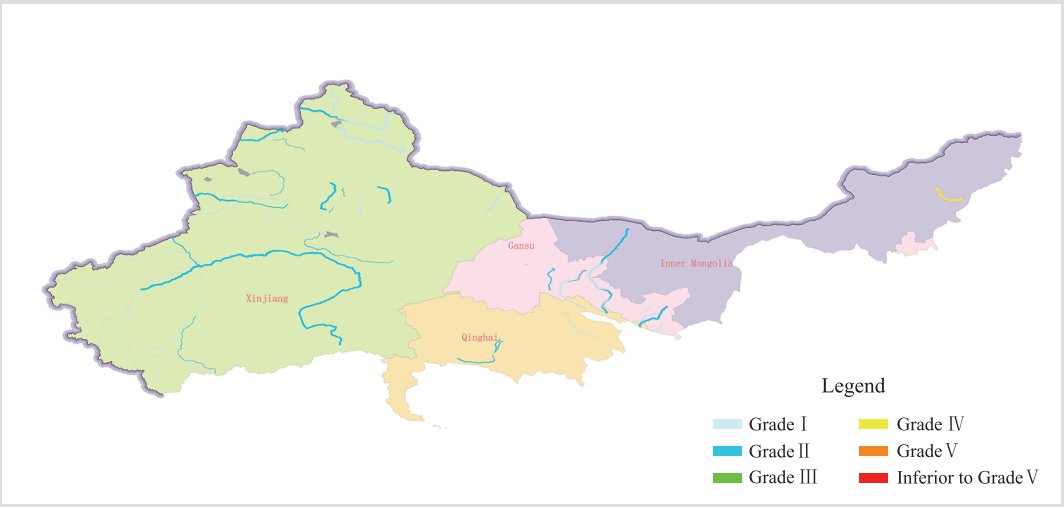
Rivers in Zhejiang Province and Fujian Province were of excellent water quality. In 125 water sections under national monitoring program, 96.8% met Grade I~III standards, up by 1.6 percentage points compared with that of 2019; no section was inferior to Grade V standard, down by 0.8 percentage point compared with that of 2019.

Water quality distribution of rivers in Zhejiang Province and Fujian Province in 2020

Water quality of rivers in Zhejiang Province and Fujian Province in 2020 and interannual comparison

Water body	Number of sections (items)	Percentage (%)						Compared with that of 2019 (percentage points)					
		Grade Ⅰ	Grade Ⅱ	Grade Ⅲ	Grade Ⅳ	Grade Ⅴ	Inferior to Grade Ⅴ	Grade Ⅰ	Grade Ⅱ	Grade Ⅲ	Grade Ⅳ	Grade Ⅴ	Inferior to Grade Ⅴ
Rivers	125	4.8	62.4	29.6	3.2	0	0	1.6	5.6	-5.6	0	-0.8	-0.8
Water sections across provincial boundaries	2	0	100.0	0	0	0	0	0	0	0	0	0	0

Rivers in northwestern part of China were of excellent water quality. In 62 water sections under national monitoring program, 98.4% met Grade I~III standards, up by 1.6 percentage points compared with that of 2019; and no water was inferior to Grade V standard, keeping the same as that of 2019.

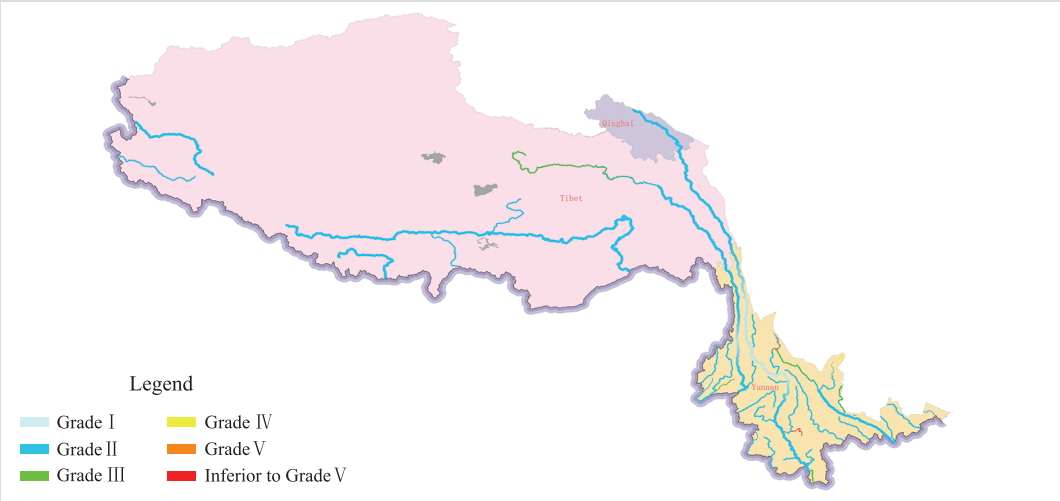


Water quality distribution of rivers in northwestern part of China in 2020

Water quality of rivers in northwestern part of China in 2020 and interannual comparison

Water body	Number of sections (items)	Percentage (%)						Compared with that of 2019 (percentage points)					
		Grade Ⅰ	Grade Ⅱ	Grade Ⅲ	Grade Ⅳ	Grade Ⅴ	Inferior to Grade Ⅴ	Grade Ⅰ	Grade Ⅱ	Grade Ⅲ	Grade Ⅳ	Grade Ⅴ	Inferior to Grade Ⅴ
Rivers	62	46.8	50.0	1.6	1.6	0	0	24.2	-21.0	-1.6	-1.6	0	0
Water sections across provincial boundaries	2	0	100.0	0	0	0	0	-50.0	50.0	0	0	0	0

Rivers in southwestern part of China were of excellent water quality. In 63 water sections under national monitoring program, 95.2% met Grade I~III standards, up by 1.5 percentage points compared with that of 2019; 3.2% were inferior to Grade V standard, keeping the same as that of 2019.



Water quality distribution of rivers in southwestern part of China in 2020

Water quality of rivers in southwestern part of China in 2020 and interannual comparison

Water body	Number of sections (items)	Percentage (%)						Compared with that of 2019 (percentage points)					
		Grade Ⅰ	Grade Ⅱ	Grade Ⅲ	Grade Ⅳ	Grade Ⅴ	Inferior to Grade Ⅴ	Grade Ⅰ	Grade Ⅱ	Grade Ⅲ	Grade Ⅳ	Grade Ⅴ	Inferior to Grade Ⅴ
Rivers	63	6.3	81.0	7.9	1.6	0	3.2	-1.6	4.8	-1.6	-1.6	0	0
Water sections across provincial boundaries	2	0	100.0	0	0	0	0	-50.0	50.0	0	0	0	0

Lakes (reservoirs)

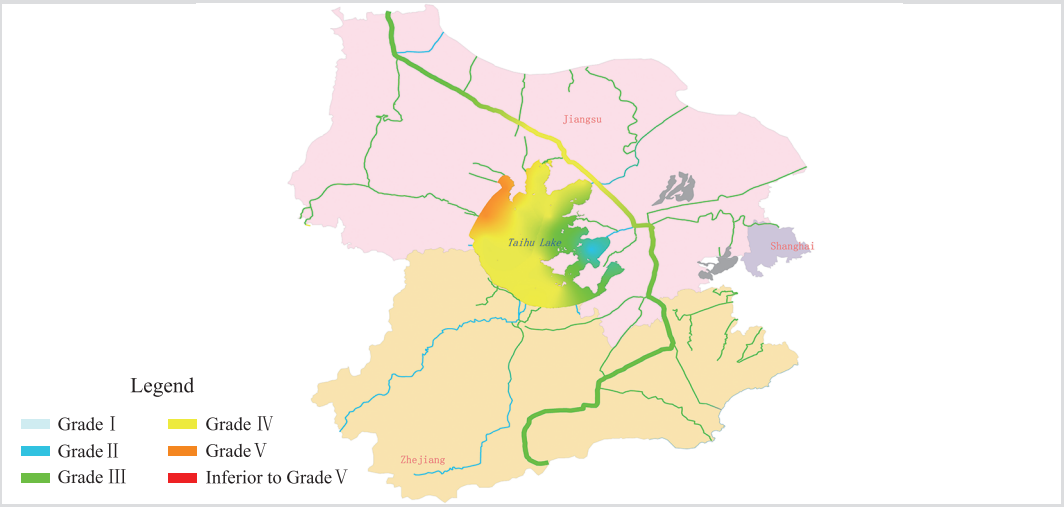
Overall status In 2020, among 112 major lakes (reservoirs) across the country under the national monitoring program, 76.8% met Grade I~III standards, up by 7.7 percentage points compared with that of 2019; 5.4% were inferior to Grade V standard, down by 1.9 percentage points compared with that of 2019. The major pollution indicators were TP, COD and permanganate index.

In the 110 major lakes (reservoirs) under the monitoring of nutritional status, 9.1% were under oligotrophic status; 61.8% were under mesotrophic status; 23.6% were under slight eutrophication; 4.5% were under intermediate eutrophication, and 0.9% were under heavy eutrophication.

The Taihu Lake The water quality of the Taihu Lake was of slight pollution. The major pollution indicator was TP. In specific, the water quality in the eastern shore line was good; that of the central area and the northern shore line were slightly polluted; and that of the western shore line was moderately polluted. The lake as a whole and all parts of the lake were under slight eutrophication.

The rivers surrounding the Taihu Lake were of excellent water quality. In 55 water sections under national monitoring program, 23.6% met Grade II standard, down by 3.7 percentage points compared with that of 2019; 70.9% met Grade III standard, up by 7.3 percentage points; 5.5% met

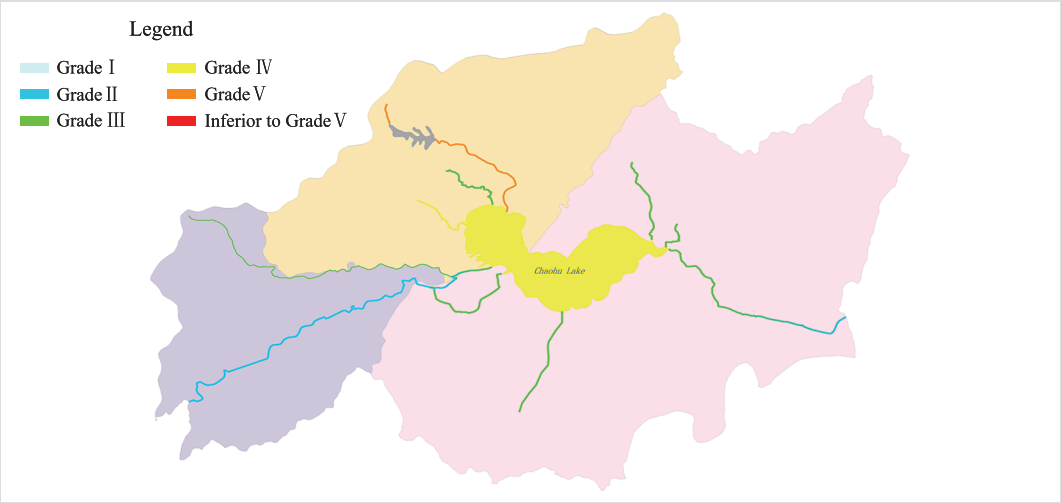
Grade IV standard, down by 3.6 percentage points; no section met Grade I, Grade V standard or failed to meet Grade V standard, remaining unchanged compared with that of 2019.



Water quality distribution of Taihu Lake Basin in 2020

The Chaohu Lake was of slight water pollution. The major pollution indicator was TP. In specific, the eastern half and the western half of the lake were both slightly polluted. The lake as a whole, the eastern half and the western half of the lake were all under slight eutrophication.

The rivers surrounding the Chaohu Lake were slightly polluted. In 14 water sections under national monitoring program, 21.4% met Grade II standard, down by 7.2 percentage points compared with that of 2019; 64.3% met Grade III standard, up by 35.7 percentage points; 7.1% met Grade IV standard, down by 7.2 percentage points; 7.1% met Grade V standard, down by 7.2 percentage points. No sections met Grade I standard or were inferior to Grade V standard, and the former was the same as that of 2019, while the latter decreased by 14.3 percentage points compared with that of 2019.

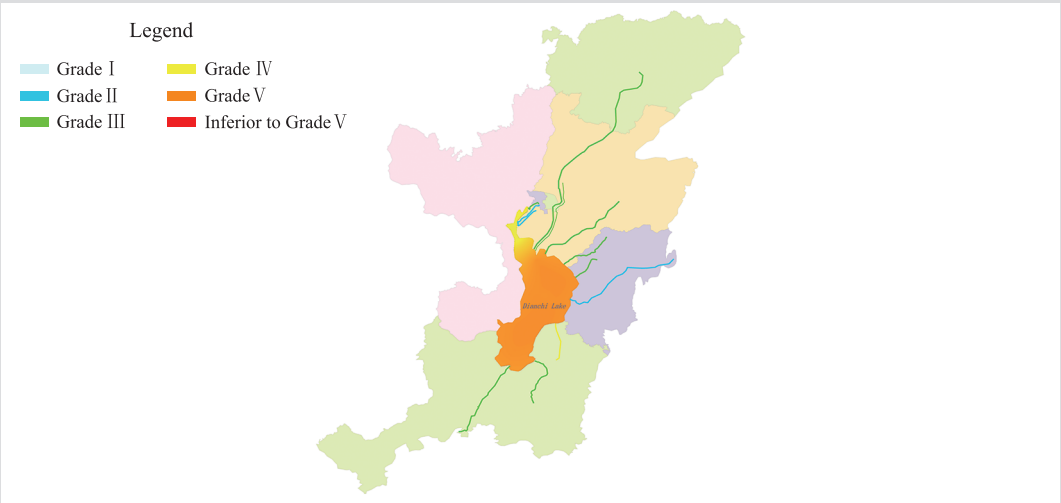


Water quality distribution of Chaohu Lake Basin in 2020

The Dianchi Lake was of slight water pollution. The major pollution indicators were COD and TP. In specific, Caohai Lake was slightly polluted, and the Waihai area of Dianchi Lake was moderately polluted. The lake as a whole, Caohai Lake and the Waihai area were all under intermediate eutrophication.

The rivers surrounding the Dianchi Lake were of slight water pollution. In 12 water sections under national monitoring program, 25.0% met Grade II standard, down by 8.3 percentage points; 66.7% met Grade III standard, up by 33.4 percentage points; 8.3% met Grade IV standard, down by 25.0 percentage points; No sections met Grade I standard or failed to meet Grade V standard, the same as that of 2019.

Danjiangkou Reservoir was of excellent water quality



Water quality distribution of Dianchi Lake Basin in 2020

and under mesotrophic status.

Erhai Lake was of excellent water quality and was under mesotrophic status.

Baiyangdian Lake was slightly polluted and was under slight eutrophication. The major pollution indicators were COD and TP.

Groundwater

In 2020, according to the monitoring by natural resources authority, among the 10,171 groundwater quality monitoring points nationwide (7,923, 910, and 1,338 groundwater monitoring points in plain basins, karst mountainous areas, and bedrock in hilly mountainous areas respectively), 13.6% met Grade I~III water quality standards, 68.8% met Grade IV standard, and 17.6% met Grade V standard. According to the monitoring by water resources authority, among the 10,242 groundwater quality monitoring points (mainly shallow groundwater), 22.7% met Grade I~III water quality standards, 33.7% met Grade IV standard, and 43.6% met Grade V standard. The major indicators exceeding standard were manganese, total hardness, and total dissolved solids.

Centralized drinking water source areas of APL cities

In 2020, among the 902 sections (sites) of the centralized drinking water source in APL cities across the country, 852 sites met the water quality standard throughout the year, taking up 94.5% of the total. In specific, 598 sections (sites) were surface drinking water source sections (sites), 584 of which met the water quality standard throughout the year, taking up 97.7%. Major pollution indicators for nonattainment were sulfate, permanganate index and TP. There were 304 groundwater drinking water source sites, 268 of which met the water quality standard throughout the year, taking up 88.2% with major nonattainment pollutants of manganese, iron and ammonia nitrogen, while the former two were mainly caused by the relatively high natural background value.

Water bodies of key water conservancy projects

The Three Gorges Reservoir Area In 2020, the water quality of the Three Gorges Reservoir Area was of excellent quality, and the 38 main tributaries of the Yangtze River flowing into Three Gorges Reservoir area were also excellent in terms of water quality. Among the 77 water quality sections under monitoring, sections meeting Grade I~III standard took up 98.7%, sections meeting Grade IV standard took up 1.3%, and no section met Grade V or failed to meet Grade V, all being the same as that of 2019. Sections under oligotrophic status took up 1.3%, under mesotrophic status 75.3%, and that under eutrophic status took up 23.4%.

South-North Water Diversion Project (East Route) The intake of the Yangtze River was of excellent quality. The water quality of the Liyun section, Baoying section, Suqian section, Bulao section, Hanzhuang section and Liangji section of the Beijing-Hangzhou Canal were all excellent and good. The Nansi Lake was under mesotrophic status, and Dongping Lake, Hongze Lake and Luoma Lake were under slight eutrophication.

South-North Water Diversion Project (Central Route) The water quality of the intake was excellent and that of the transferring lines was also excellent. All 9 tributaries flowing into the Danjiangkou Reservoir were of excellent water quality, and Danjiangkou Reservoir was in a mesotrophic status.

Inland fishery waters

In 2020, the leading nonattainment indicators of key fishery water basins in rivers were TN and TP. Compared with 2019, the standard-exceeding range of TN, petroleum and non-ionic ammonia increased slightly, and that of TP, permanganate index, volatile phenol and copper decreased slightly. The leading standard-exceeding indicators of key fishery water basins in lakes (reservoirs) were TN, TP and permanganate index. Compared with 2019, the standard-exceeding range of TN, volatile phenol and copper grew slightly, and that of TP, permanganate index and petroleum narrowed down slightly. The key standard-exceeding indicator in the water bodies of 40 national aquatic germplasm resources conservation areas (inland) was TN.

Water ecology in major river basins

In 2020, pilot surveys and monitoring of water ecological status were carried out in the seven major river basins including the Yangtze River, Yellow River, Huaihe River, Haihe River, Pearl River, Songhua River and Liaohe River. The indicators under survey included the physical and chemical indicators of water quality, aquatic biological indicators and physical habitat indicators. The evaluation results of 507 sections (sites)* shown that the water ecological status of major river basins in the country was mainly of intermediate-good status, with sections (sites) of excellent and good status accounting for 35.7%, intermediate status accounting for 50.4%, and poor and very poor status accounting for 14.0%.

*In 2020, a total of 530 sections (sites) were set up and included in the pilot work for the surveys and monitoring of water ecological status in the seven major river basins, and 23 sections (sites) were not included in the evaluation due to lack of indicators.

Marine Environment

Marine water quality

Sea area under jurisdiction In 2020*, the sea areas meeting Grade I standard took up 96.8% of the total area under jurisdiction, which basically stood at the same level of 2019; 30,070 km^2 were inferior to Grade IV standard, 1,730 km^2 more than that of 2019. The main standard-exceeding indicators were inorganic nitrogen and activate phosphate.

Nearshore sea areas In 2020, the water quality of nearshore sea areas** in China was relatively good with steady betterment. 77.4% of the total sea areas met Grade I & II water quality standards, up by 0.8 percentage point compared with that of 2019; 9.4% failed to meet Grade IV standard, down by 2.3 percentage points compared with that of 2019. The major standard-exceeding indicators were inorganic nitrogen and active phosphates.

The nearshore water quality of coastal provinces of Liaoning, Hebei, Shandong, Guangxi and Hainan provinces was excellent; that of Fujian and Guangdong provinces was good; that of Tianjin municipality was relatively good; that of Jiangsu and Zhejiang provinces was poor, and that of Shanghai municipality was extremely poor.

Among the 44 gulfs covering the area of more than 100 km^2, the water quality of 8 gulfs under monitoring failed to meet Grade IV standard in the time of spring, summer and autumn, 5 less than that of 2019. The main pollution indicators were ammonia nitrogen and active phosphate.

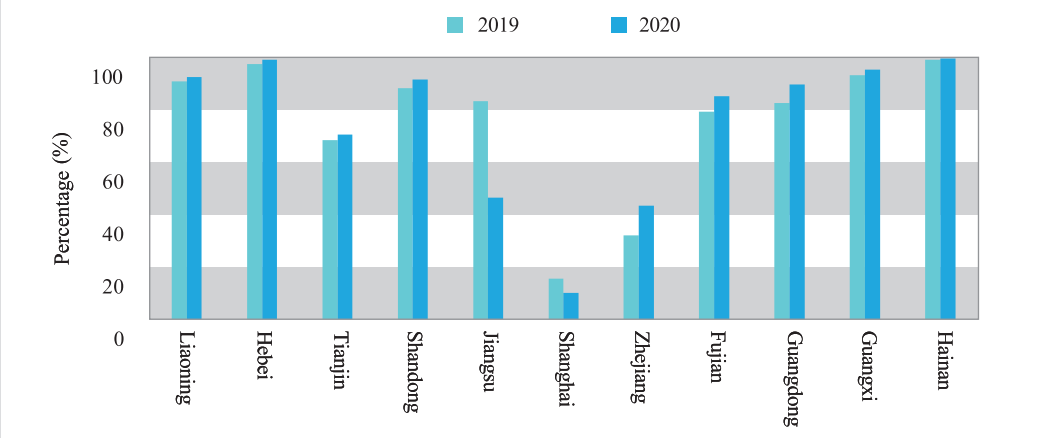
The sea areas under jurisdiction of China failing to meet Grade I standard in 2020

Sea area	Marine area (km^2)				
	Grade Ⅱ	Grade Ⅲ	Grade Ⅳ	Inferior to Grade Ⅳ	Total
Bohai Sea	9, 170	2, 300	1, 020	1, 000	13, 490
Yellow Sea	7, 430	8, 300	4, 550	5, 080	25, 360
East China Sea	10, 800	8, 910	6, 810	21, 480	48, 000
South China Sea	3, 330	1, 140	1, 100	2, 510	8, 080
Sea area under jurisdiction	30, 730	20, 650	13, 480	30, 070	94, 930

*The water quality of the sea areas under jurisdiction is the result of monitoring in summer.

**Nearshore waters: refers to the sea area stipulated in the *National Marine Functional Zoning (2011-2020)*. The water quality is the result of monitoring in spring, summer and autumn.

Water quality of sea area under jurisdiction of China in 2020

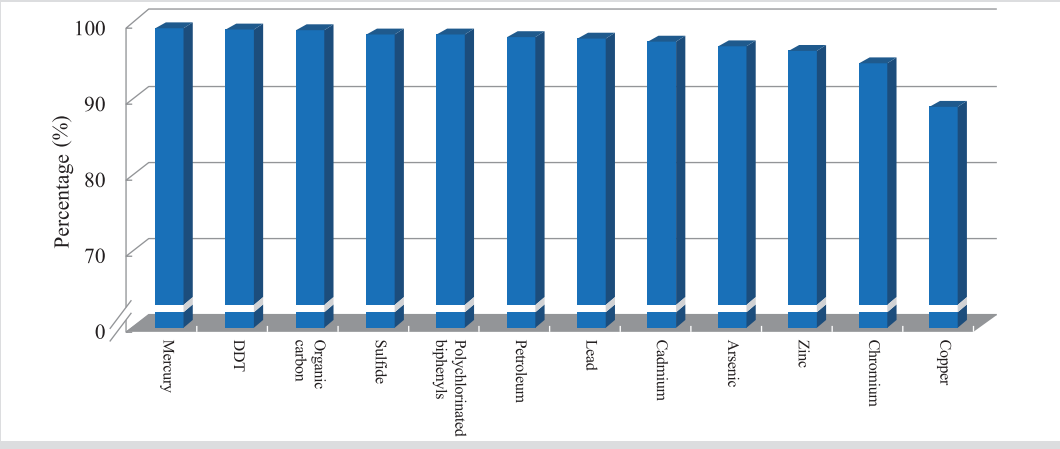


Percentage of excellent and good quality seawater in nearshore waters of coastal provinces in 2020 and interannual comparison

Marine sediment

In 2020, the monitoring sites with good sediment quality in the jurisdictional sea areas took up 96.5%. In specific, the monitoring points (sites) with good sediment quality in Bohai Sea and the Yellow Sea reached 100% each, and that in East China Sea and the South China Sea took up 97.1% and 91.7% respectively.

The percentage of sites where the copper content in the coastal sea sediments met the quality standards of Type I marine sediments was 89.2%, and the percentages of other monitoring indicators meeting the quality standards of Type I marine sediments were all above 95%.



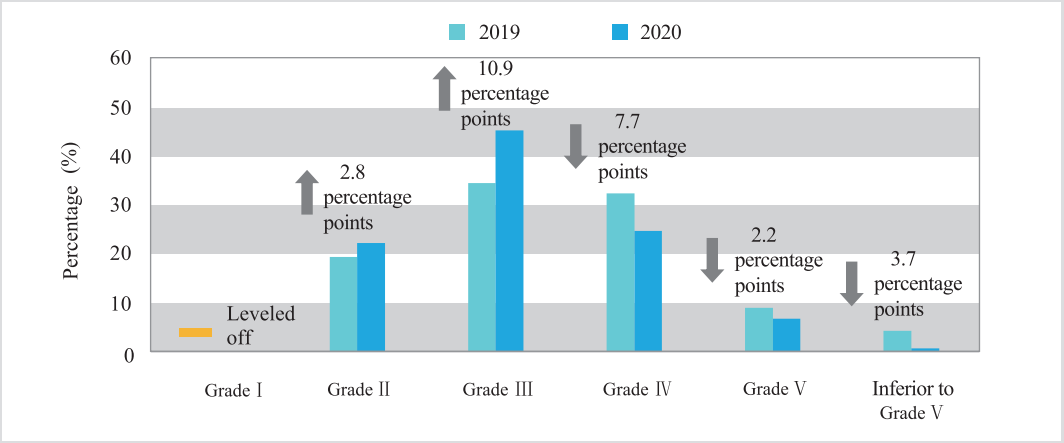
Percentage of sites where the monitoring indicators in nearshore waters met the quality standards of Type I marine sediments in 2020

Typical marine ecosystem

In 2020, among the 24 typical marine ecosystems monitored, 7 were in a healthy state, 16 were in a sub-healthy state, and 1 was in an unhealthy state. In specific, 7 estuary ecosystems in sub-healthy state included the Yalu River Estuary, Shuangtaizi Estuary, Luanhe River Estuary-Beidaihe, Yellow River Estuary, Yangtze River Estuary, Minjiang Estuary and Pearl River Estuary; 7 bay ecosystems in sub-healthy state included Bohai Bay, Laizhou Bay, Jiaozhou Bay, Yueqing Bay, areas along the coast of East Fujian, Daya Bay and Beibu Gulf, while Hangzhou Bay was in an unhealthy state; the ecosystem of the northern Jiangsu shoal wetland was in a sub-healthy state; that of four coral reefs in the southwest coast of Leizhou Peninsula, Beihai of Guangxi, the east coast of Hainan and Xisha was in a healthy state; the mangrove ecosystems of Beihai and Beilun estuary of Guangxi were in a healthy state; the seagrass bed ecosystem in Beihai of Guangxi was in a healthy state, and that on the east coast of Hainan was in a sub-healthy state.

Sea-going rivers

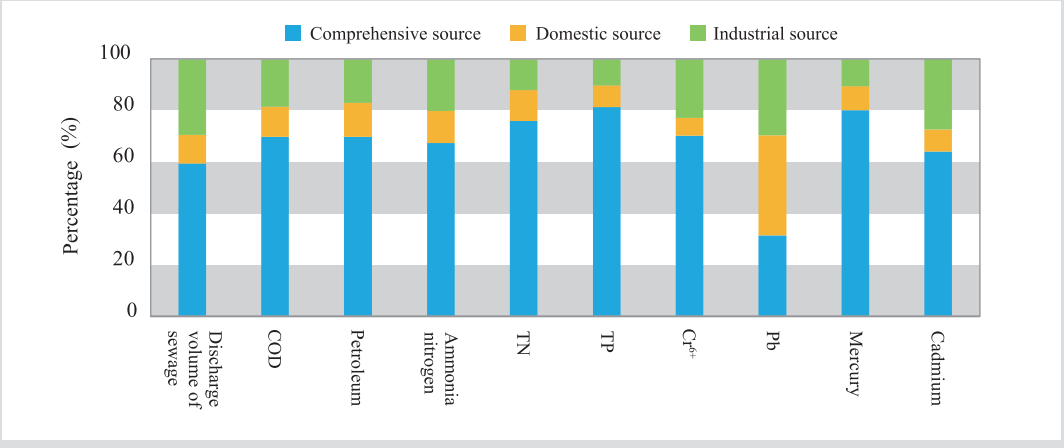
In 2020, out of the 193 monitoring sections of the rivers flowing into sea, no section met Grade I standard. Sections meeting Grade II standard took up 22.3%; Grade III standard 45.6%; Grade IV standard 24.9%; Grade V standard 6.7%; and those failing to meet Grade V standard took up 0.5%. The main standard-exceeding indicators were COD, permanganate index, BOD_5, TP and ammonia nitrogen.



Water quality of sea–going rivers in 2020 and interannual comparison

In-situ sea pollution sources

The monitoring results of 442 in-situ sea pollution sources with daily discharge volume>100 tons shown that the total discharge volume of effluent was about 7.12993 billion tons. Among the different types of pollution sources, the comprehensive sources made the largest share of sewage discharge, followed by industrial sources and with domestic sources discharge being the smallest amount. The comprehensive sources also made the largest volume of discharge for all pollutants except for lead.



The percentage of In-situ sea discharge of pollutants from different types of sources in 2020

Marine fishery waters

In 2020, the major standard-exceeding indicators in key spawning grounds, feeding grounds, migration channels as well as in nature reserve areas for key fishery resources were inorganic nitrogen and active phosphate. There was a bit increase of nonattainment area of inorganic nitrogen, active phosphate and petroleum compared with that of 2019, and a bit decrease of nonattainment area of COD. The primary pollution indicator was inorganic nitrogen in key marine culture areas. There was a bit increase of petroleum and a bit decrease of inorganic nitrogen, active phosphate and COD in nonattainment area compared with that of 2019. The major standard-exceeding indicator in 7 national aquatic germplasm resource protection areas (seas) was inorganic nitrogen, and the sediments of 26 key marine fishery waters were in a good state.

Soil Environment

Soil environmental quality

The detailed survey results of soil pollution show that the overall soil environmental conditions of agricultural land in the country were generally stable. The main pollutants affecting the soil environmental quality of agricultural land were heavy metals, of which cadmium was the primary pollutant. The objectives to achieve a safe utilization rate of contaminated cultivated land of about 90% and a safe utilization rate of contaminated plots of more than 90% were realized as planned in *the Action Plan for Soil Pollution Prevention and Control*.

Quality of cultivated land

As of the end of 2019, the average grade of cultivated land quality nationwide was 4.76[*]. Among them, the areas of the first to third grades accounted for 31.24% of the total cultivated areas; that of the fourth to sixth grades accounted for 46.81%; and that of the seventh to tenth grades accounted for 21.95%.

Water loss and soil erosion

In 2019[**], there were 2.7108 million km^2 land subject to water and soil erosion in China, 26,100 km^2 less than that of 2018. In specific, 1.1347 million km^2 were under water erosion and 1.5761 million km^2 were under wind erosion. In terms of the erosion intensity, the areas of mild, moderate, severe, extremely severe and fierce erosion accounted for 62.92%, 17.10%, 7.55%, 5.89% and 6.54% of the total area of soil erosion in the country respectively.

Land desertification and sandification across China

The monitoring results of the Fifth National Monitoring of Desertification Land and Sandy Land shown that there were 2.6116 million km^2 desertified land and 1.7212 million km^2 sandy land across the country. According to the results of the Third Monitoring of Rocky Desertification in the karst area, the existing rocky desertification land area in the karst area of China is 100,700 km^2[***].

[*]The grade of cultivated land quality is based on *Cultivated Land Quality Grade (GB/T 33469-2016)* with the classification of ten grades. The quality of first-class cultivated land is the best, and the quality of the tenth grade is the worst. The first to third grades, the fourth to sixth grades, the seventh to tenth grades are further divided into high grade, medium grade and low grade respectively. Up to the time this Report was published, the results of the cultivated land quality in 2019 are the latest data.

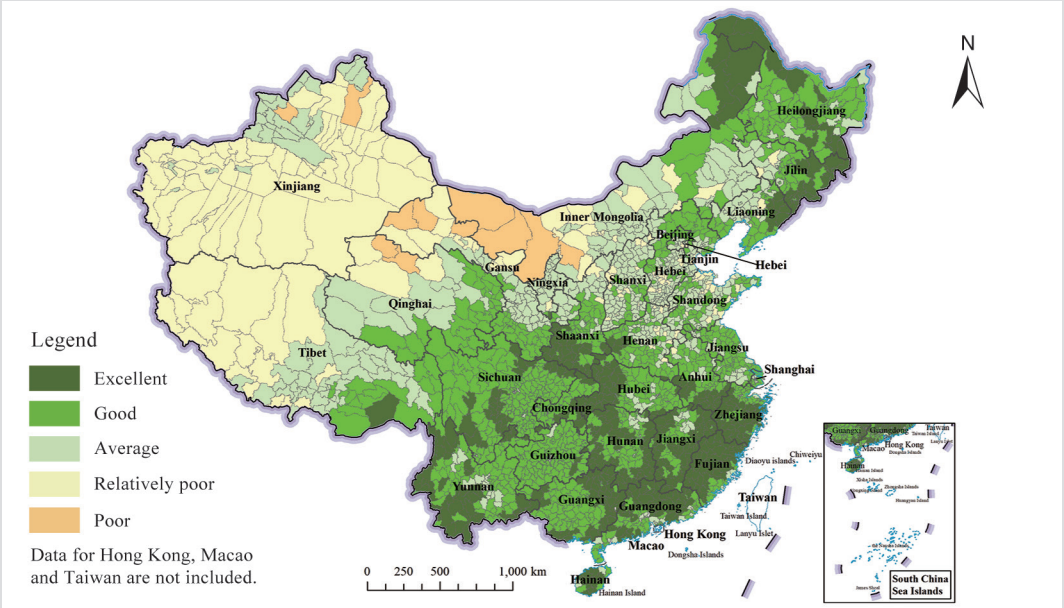
[**]Up to the time this Report was published, the monitoring results of water and soil erosion in 2019 are the latest data.

[***]Up to the time this Report was published, the monitoring results of the Fifth National Monitoring of Desertification Land and Sandy Land and the Third Monitoring of Rocky Desertification remain to be the latest.

Natural and Ecological Environment

Ecological environment quality

In 2020, the Ecological Index (EI) of eco-environmental quality was 51.7 and the eco-environmental quality* was generally good, with no obvious change compared with that of 2019**. The total area of counties with "excellent" or "good" eco-environmental quality took up 46.6% of total land area, mainly distributed in the region east to Tibetan Plateau, south to Qinling Mountain and the Huaihe River, the Daxing'anling and Xiaoxing'anling Mountain areas as well as Changbai Mountain region in Northeast China. The total area of counties with average eco-environmental quality took up 22.2%, mainly distributed in regions such as North China Plain, HuangHuaiHai Plain, central and western parts of Northeast China Plain and central part of Inner Mongolia. The total area of counties with relatively poor or poor eco-environmental quality took up 31.3% of the total, mainly distributed in western part of Inner Mongolia, central and western part of Gansu, western part of Tibet and most parts of Xinjiang.



Map of countywide eco-environmental quality of China in 2020

*Eco-environmental quality is assessed according to the *Technical Criterion for Ecosystem Status Evaluation (HJ 192-2015)*. Ecological Index ≥ 75 indicates excellent environment with high vegetation coverage, rich biodiversity and stable ecosystems. Ecological Index ranging between 55~75 indicates good environment with relatively high vegetation coverage, relatively rich biodiversity and being suitable for human living. Ecological Index within the range of 35~55 refers to ordinary eco-environment with intermediate vegetation coverage, general biodiversity and being relatively suitable to human living but with some factors constraining human life. Ecological Index within 20~35 refers to relatively poor eco-environment with poor vegetation coverage, severe drought, less species and factors evidently constraining human life. Ecological Index < 20 refers to poor eco-environment with bad conditions and constraints on human life.

**Changes in ecological quality are divided into 4 levels: no obvious change ($|\Delta EI| < 1$), slight change ($1 \leqslant |\Delta EI| < 3$), obvious change($3 \leqslant |\Delta EI| < 8$) and significant change ($|\Delta EI| \geqslant 8$).

In 2020, among the 810 counties of national key ecological functional areas subject to the dynamic assessment of the ecological environment, the eco-environmental quality of 22.7% of the counties turned better, that of 71.7% remained basically stable, and that of 5.6% turned worse compared with 2018.

Biodiversity

Ecosystem diversity China boasts all the types of terrestrial ecosystem on earth including 212 types of forest, 36 types of bamboo forest, 113 types of shrubs, 77 types of meadows, 55 types of prairies, 52 types of deserts and 30 types of natural wetlands. China is also home to various marine ecosystems including the mangroves, coral reefs, sea grass beds, islands, gulfs, estuaries and upwelling current as well as such artificial ecosystems as cropland, artificial forest, artificial wetland, artificial grassland and urban ecosystem.

The national forest coverage rate was 23.04%. The forest stock volume was 17.56 billion m^3, including 14.108 billion m^3 of natural forests and 3.452 billion m^3 of artificial forests. The total biomass of forest vegetation was 18.802 billion tons, and the total carbon stock was 9.186 billion tons*.

The national grassland comprehensive vegetation coverage was 56.1%, and the natural grassland fresh grass output has stabilized at around 1.1 billion tons.

Biodiversity A total of 122,280 species and subspecies have been discovered in China covering 54,359 animalia species, 37,793 botanical species, 463 bacteria species, 1,970 pigment species, 12,506 fungi, 2,485 protogenesis animalia and 655 viruses. A total of 406 rare and endangered wildlife species are included in the National Catalogue of Wildlife under Key State Protection, and several hundred animal species are unique to China including giant panda, golden monkey, Tibetan antelope and crossoptilon mantchuricum. 302 species (categories) of rare and endangered aquatic wildlife are included in the National Catalogue of Wildlife under Key State Protection. The Yangtze finless porpoise and Chinese alligator are unique to China. A total of 246 species of 8 categories of rare and endangered plants are included in the National Catalogue of Wildlife under Key State Protection, and a total of 9,302 types of macro-fungi have been identified.

Genetic resource diversity China has 1,339 cultivated varieties of 528 species of cultivated crops with over 1,000 economic tree species. A total of 7,000 varieties of ornamental plants and 948 varieties of domestic animals are originated from China.

Endangered species

The assessment results of 34,450 species of higher plants across China shown that 10,102 species of higher plants were subject to special attention and protection, taking up 29.3% of the total assessment number, among which, 3,767 species were endangered, 2,723 species belong to NT Grade, and 3,612 belong to DD Grade. The endangerment assessment results of the 4,357 identified vertebrates (marine fishes were not included) shown that 2,471 vertebrates were subject to special attention and protection, taking up 56.7% of the total assessment number, among which 932 vertebrates were endangered, 598 vertebrates belong to NT Grade, and 941 belong to DD Grade. The endangerment assessment results of the 9,302 identified macro-fungi shown that 6,538 species of macro-fungi were subject to special attention and protection, taking up 70.3% of the total assessment number, among which 97 macro-fungi were endangered, 101 macro-fungi belong to NT Grade, and 6,340 belong to DD Grade.

Invasive alien species

More than 660 invasive alien species have been found across the country, among which, 71 species have caused or had potential threat to natural ecosystems and included in the *List of China's Invasive Alien Species*. The survey results on invasive alien species covering 69 national nature reserves shown that 219 species of invasive alien species have invaded national nature reserves, and 48 of them were included in the *List of China's Invasive Alien Species*.

*Up to the time this Report was published, the results of 9th National Inventory of Forest Resources were the latest data.

Protected natural areas

The country has established 474 national nature reserves with a total area of about 983,400 km^2. There are 244 national-level scenic spots with a total area of about 106,600 km^2. There are 281 national geological parks with a total area of about 46,300 km^2. There are 67 national marine parks with a total area of about 7,370 km^2. There are 10 national park pilot areas for Northeast Tiger Leopard, Qilian Mountains, giant pandas, Sanjiangyuan, Hainan tropical rainforest, Wuyi Mountain, Shennongjia, Potatso, Qianjiangyuan and Nanshan, with a total area of more than 220,000 km^2, accounting for approximately 2.3% of national territory area.

The remote sensing monitoring shown that in the first and latter half of year 2020, there were 162 and 229 clues related to newly added or expanded facilities in national nature reserves under four types of key issues, namely, mining and sand mining, industrial and mining enterprises, tourist facilities, and hydropower facilities, with a total area of 0.94 km^2 and 1.42 km^2 respectively.

Ecological Status of the Yellow River Basin

The results of the remote sensing survey and evaluation of changes in the ecological conditions of the Yellow River Basin shown that from 2000 to 2019, the overall vegetation coverage of the Yellow River Basin had increased significantly, with the average coverage rate rising from 24.0% to 38.8%. The climate in the upstream of the Yellow River shown a trend of “warming and humidification”, and the percentages of excellent and good grade forests, shrubs and grassland ecosystems have increased. The acceleration of cryosphere melting has reduced the glacier area of Amne Machin by 18.7%, increased the occurrence of extreme weather and climate events as well as the risks of natural disasters.

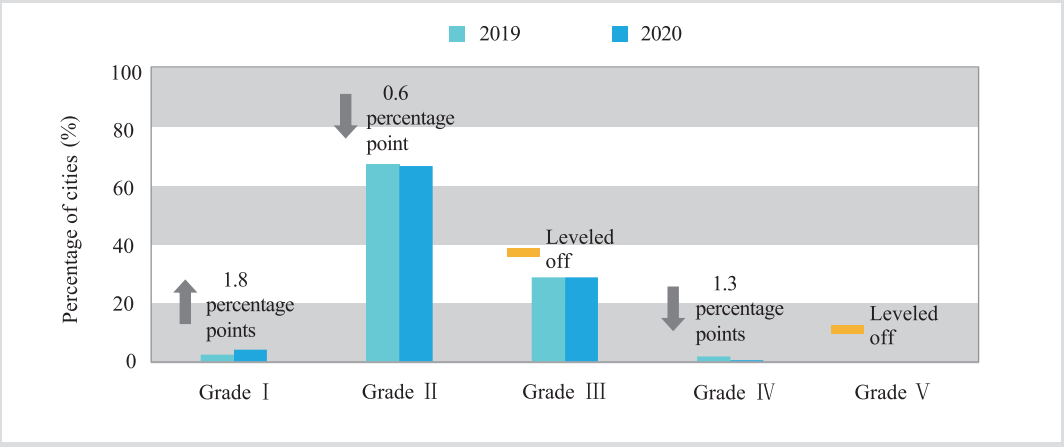
Acoustic Environment

Regional Acoustic Environment

In 2020, regional daytime acoustic environment of 324 APL cities has been monitored, and the average equivalent sound level was 54.0 dB(A). Among them, 14 cities met Grade I daytime environmental noise standard, taking up 4.3%; 215 cities met Grade II standard, taking up 66.4%; 93 cities met Grade III standard, taking up 28.7%; 2 cities met Grade IV standard, taking up 0.6%; and no city met Grade V standard*.

Acoustic environment of traffic noise

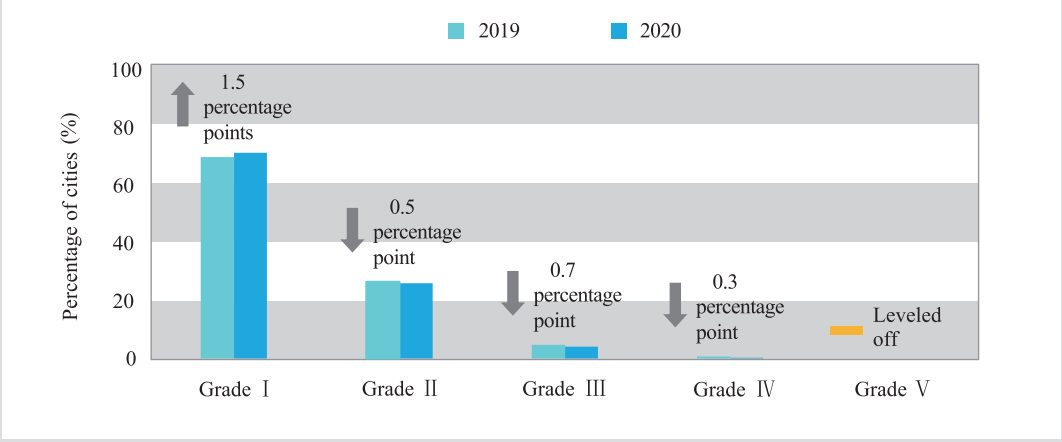
In 2020, the acoustic environment of traffic noise of 324 APL cities had been monitored in the daytime, and the average equivalent sound level was 66.6 dB(A). Among them, 227 cities met Grade I daytime traffic noise standard, taking up 70.1%; 83 cities met Grade II standard, taking up 25.6%; 13 cities met Grade III standard, taking up 4.0%; and 1 city met Grade IV standard, taking up 0.3%; and no city met Grade V standard**.



Percentage of cities with various grades of urban daytime regional acoustic environmental noise across China in 2020 and interannual comparison

*The average equivalent sound level of regional daytime acoustic environment ≤ 50.0 dB(A) is excellent (Grade I); 50.1~55.0 dB(A) is good (Grade II); 55.1~60.0 dB(A) is average (Grade III); 60.1~65.0 dB(A) is relatively poor (Grade IV) and > 65.0 dB(A) is poor (Grade V).

**The average equivalent sound level of traffic acoustic environment in the daytime ≤ 68.0 dB(A) is excellent (Grade I); 68.1~70.0 dB(A) is good (Grade II); 70.1~72.0 dB(A) is average (Grade III); 72.1~74.0 dB(A) is relatively poor (Grade IV) and > 74.0 dB(A) is poor (Grade V).



Percentage of cities with various grades of urban daytime regional acoustic environmental traffic noise across China in 2020 and interannual comparison

Acoustic environment of functional zones

In 2020, acoustic environment of functional zones* of 311 APL cities has been monitored, the daytime attainment rate of which was 94.6%, and the nighttime attainment rate was 80.1%.

Attainment rate of different functional zones of cities across China in 2020 and interannual comparison (Unit: %)

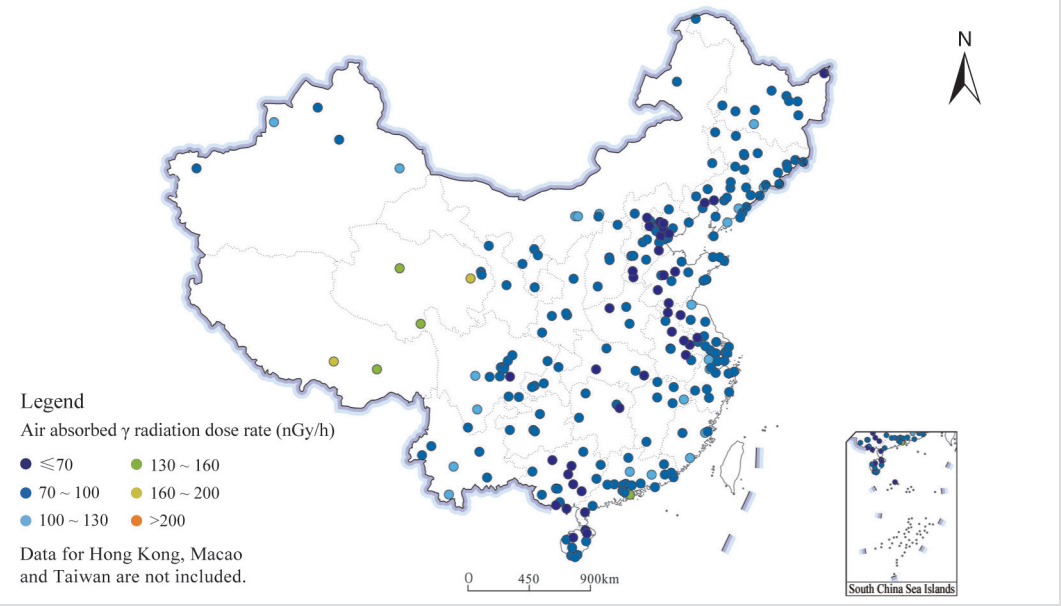
Year	Type 0		Type 1		Type 2		Type 3		Type 4a		Type 4b	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
2020	75.5	57.4	89.1	75.3	94.8	88.1	98.9	91.9	97.3	62.9	95.7	81.2
2019	74.0	55.0	86.1	71.4	92.5	83.8	97.1	88.8	95.3	51.8	95.8	83.3

*Type 0 function area refers to the areas requiring special quiet environment such as rehabilitation and recuperation area. Type 1 function area refers to the areas with residential community, health care, culture and education, scientific research and design, administration and offices as the main functions, which need quiet environment. Type 2 function area refers to the areas with commerce, finance and market as main functions or areas mixing residential communities, commerce and industries, which need to maintain quiet residential environment. Type 3 function area refers to the areas dominated by industrial production, warehouse and logistics and in need of prevention of the strong impacts of industrial noise on surrounding environment. Type 4a function area refers to the areas along highways. Type 4b function area refers to the areas along railways.

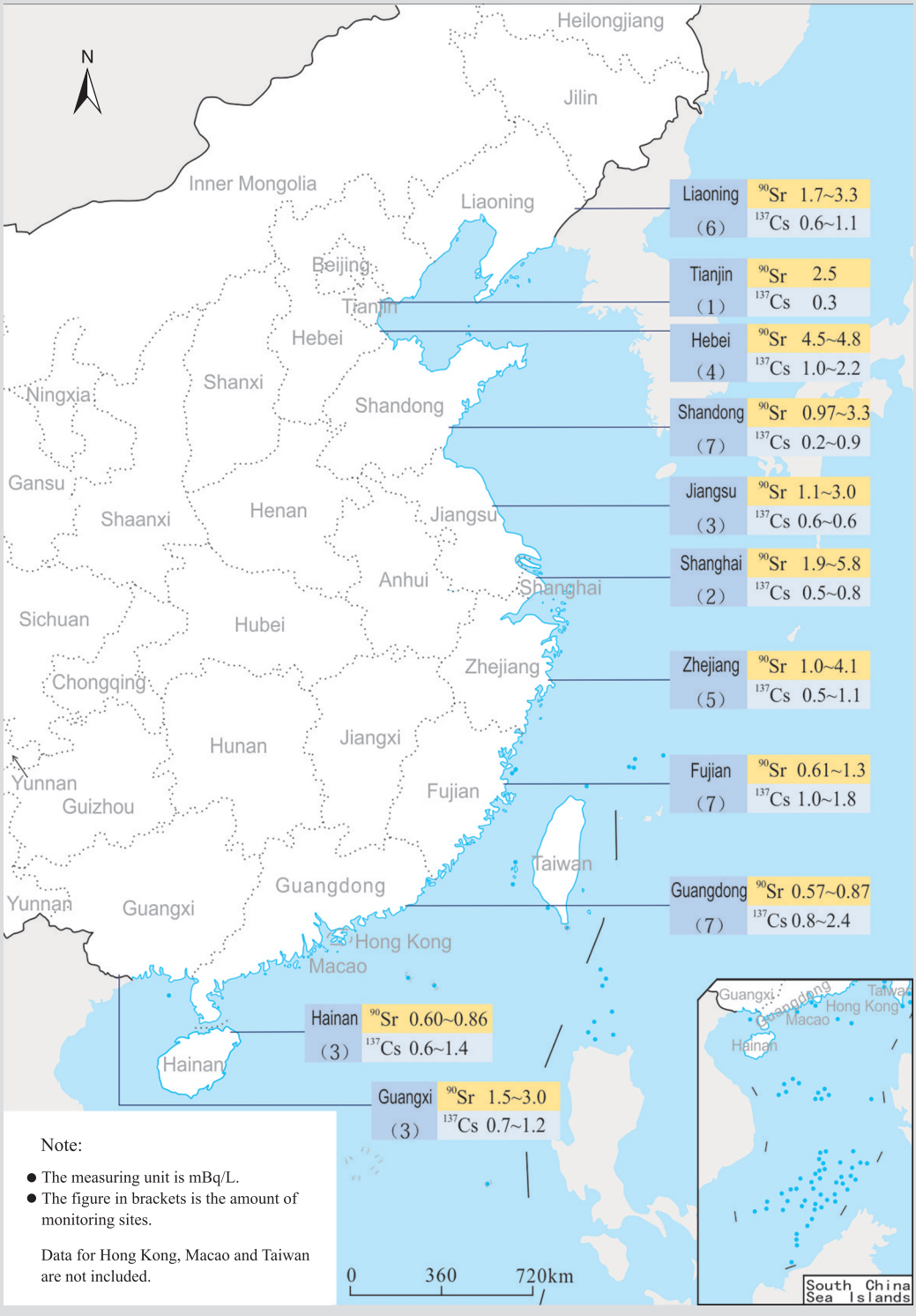
Radiation Environment

Ionizing radiation

The environmental ionizing radiation level in China remained within the fluctuation range of natural background level in 2020. The real-time continuous air absorbed γ radiation dose rate and accumulated dose rate were within the fluctuation range of natural baseline value. The natural radionuclide activity concentrations in the air were within the natural background level. There was no abnormal situation of artificial radionuclide activity concentrations in the air. The activity concentration of natural radionuclides of the 7 major river basins including Yangtze River, Yellow River, Pearl River, Songhua River, Huaihe River, Haihe River, Liaohe River, rivers in Zhejiang and Fujian, rivers in Northwest China, rivers in Southwest China and major lakes (reservoirs) remained at the baseline level, and there was no abnormal situation of the activity concentration of artificial radionuclides. The activity concentration of gross α and gross β of urban centralized drinking water sources and groundwater met the guidance limit of radioactivity specified in the *Standard for Drinking Water Quality (GB 5749-2006)*. The activity concentration of natural radionuclides of nearshore marine water and organisms was at the baseline level. There was no abnormal situation of the activity concentration of artificial radionuclides. In specific, the activity concentration of artificial radionuclides of marine water was far below the limit specified in the *Marine Water Quality Standard (GB 3097-1997)*. The activity concentration of natural radionuclide of soil was at the baseline level, and there was no abnormal situation of the activity concentration of artificial radionuclide.



Map of the real-time consecutive air absorbed γ radiation dose rate monitored at radiation environment automatic monitoring stations in China in 2020



Map of the activity concentration of Sr–90 and Cs–137 of nearshore water in China in 2020

Environment ionizing radiation in the vicinity of in-service nuclear power plants In 2020, no abnormal real-time consecutive air absorbed γ radiation dose rate caused by operational nuclear power plants had been monitored in the surrounding areas of in-service nuclear power bases. There was no abnormal activity concentration of radionuclides in air, water, soil and organisms in the vicinity of Sanmen Nuclear Power Base, Haiyang Nuclear Power Base, Yangjiang Nuclear Power Base, Taishan Nuclear Power Base, Fangchenggang Nuclear Power Base and Changjiang Nuclear Power Base. There was slight rise in activity concentration of tritium in some environmental media in the vicinity of Hongyanhe Nuclear Power Base, Tianwan Nuclear Power Base, Qinshan Nuclear Power Base, Ningde Nuclear Power Base, Fuqing Nuclear Power Base and Dayawan Nuclear Power Base compared with the background value before the operation of those nuclear power plants. There was no abnormal activity concentration of other artificial radionuclides in the environmental medium. The assessment findings shown that the radiation dose to the public of the above-mentioned nuclear power bases was far below the national limit, having no impact on environmental safety and public health.

Environment ionizing radiation in the vicinity of civil research reactors In 2020, there was no detected abnormal situation of air absorbed γ radiation dose rate and activity concentration of radionuclides in aerosol, sediments, water and soil in the vicinity of research facilities such as Institute of Nuclear and New Energy Technology of Tsinghua University and miniature neutron source reactor in Shenzhen University. There was slight increase of activity concentration of Sr-90 and iodine-131 in the vicinity of the production and research areas of China Institute of Atomic Energy Science, and slight increase of cobalt-60 and iodine-131 in the vicinity of the production and research areas of Nuclear Power Institute of China. The assessment findings shown that the radiation dose to the public of the above-mentioned civil research reactors and production and research sites was far below relevant national limit, having no impact on environmental safety and public health.

Environment ionizing radiation in the vicinity of nuclear fuel cycle facilities and waste disposal facilities In 2020, the γ radiation air absorbed dose rate of vicinity environment of CNNC Lanzhou Uranium Enrichment Co. Ltd., CNNC Shaanxi Uranium Enrichment Co. Ltd., CNNC North China Nuclear Fuel Element Co. Ltd., CNNC Jianzhong Nuclear Fuel Element Co. Ltd., CNNC 272 Uranium Limited Liability Company and CNNC 404 Co. Ltd., and Northwest Disposal Site for Low and Medium Level Radioactive Waste and Beilong Disposal Site for Low and Medium Level Radioactive Waste was within the fluctuation range of natural baseline value. There was no detected abnormal activity concentration of radionuclides in environmental media in relation to the activities of the above enterprises.

Environment ionizing radiation in the vicinity of uranium mines and metallurgical plants In 2020, the air absorbed γ radiation dose rate in the vicinity of uranium mining and metallurgical facilities, and the concentration of radionuclides in air, surface water, groundwater and soil related to facility activities were within the range of fluctuations over the years.

Electromagnetic radiation

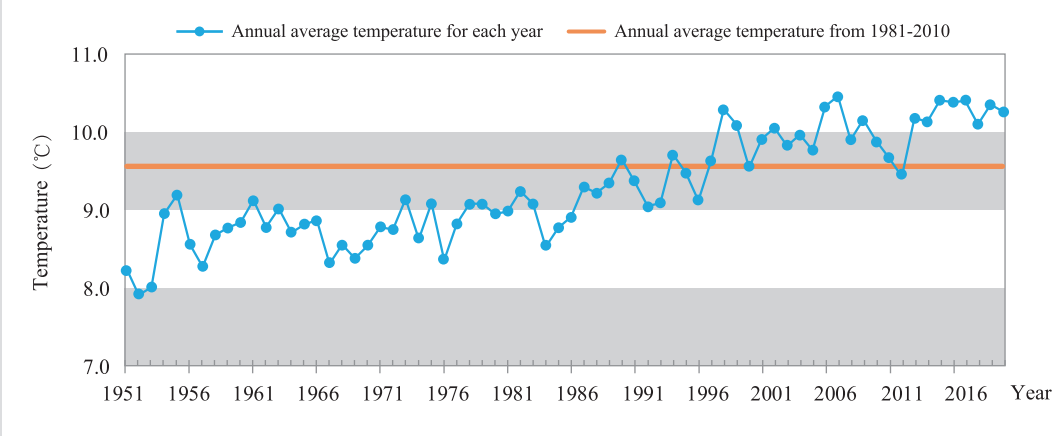
In 2020, the environment electromagnetic radiation level of state monitoring sites in 31 provinces (autonomous regions and municipalities), and that of radio and television signal emitting facilities, power transmission and transformation facilities and antenna of mobile communication base stations were all lower than the public exposure limit specified in the *Controlling Limits for Electromagnetic Environment (GB 8702-2014)*.

Climate Change and Natural Disasters

Climate change

Air temperature In 2020, the national average air temperature was 10.25°C, 0.7°C higher than the historical average and a little bit lower than that of 2019, being the eighth warmest year since 1951. The temperature in each month of the year was on the high side, expect for being 0.7°C lower in December.

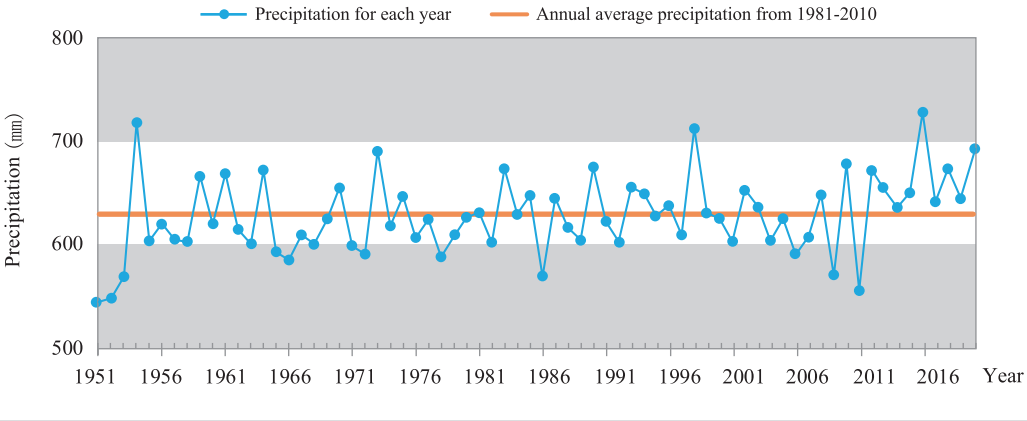
The average temperature in the six major regions of the country was higher than the historical average. Among them, the temperature in South China was 0.7°C higher, the third highest in historical records. Except for the slightly lower temperature in southeastern part of Chongqing, the temperature of other parts was higher than the historical average, among which the temperatures were 1~2°C higher in northern Northeast China, eastern and southern part of regions south to the Yangtze River, eastern part of South China, northeast part of Inner Mongolia, most parts of Hainan, central part of Yunnan, and northeast part of Xinjiang.



Interannual change of national average air temperature from 1951–2020

Precipitation The national average precipitation was 694.8 mm in 2020, up by 10.3% compared with the historical average and up by 7.6% compared with that of 2019, being the fourth highest year since 1951. The precipitation was higher than the historical average in January-March and June-September, among which the precipitation in January was 76% more than the historical average; the precipitation in April, May, and October-December was less than the historical average, among which the precipitation in December was 45% less than the historical average.

The annual precipitation in Huangshan mountain (3,314.6 mm) and Qimen (2,975.8 mm) of Anhui province were the highest and second highest in the country, while Tazhong (4.1 mm) and Ruoqiang (5.8 mm) in Xinjiang were the lowest and second lowest in the country.



Interannual change of national average precipitation from 1951–2020

Distribution of precipitation in China in 2020

Precipitation (mm)	Distribution areas
＞2, 000	Southern Anhui, southeastern part of Hubei, northern Jiangxi, western Zhejiang, northwestern part of Fujian, parts of northwestern Hunan, parts of northeastern Guangxi
1, 200~2, 000	The middle and lower reaches of the Yangtze River, most parts to the South of the Yangtze River, southwestern Yunnan
400~1, 200	Northeast China, North China, southeastern part of Northwest China, Huanghuai, most parts of Jianghuai, northern part of Jianghan, northeastern Inner Mongolia, southern Qinghai, eastern Tibet, most parts of Sichuan and Yunnan
100~400	Central part of Inner Mongolia, most parts of Ningxia, central part of Gansu, central part of Qinghai, central part of Tibet, northern Xinjiang
＜100	Central and southern Xinjiang, northwestern Qinghai, western Gansu, western Inner Mongolia, western Tibet

Compared with average year, the precipitation was 20%~50% more than historical average in the central and northern parts of Northeast China, southern and eastern Huanghuai, most of parts of Jianghan, most parts of Jianghuai, northern Jiangnan, northeastern Inner Mongolia, southeastern Gansu, central Shanxi, southern Hebei, central Sichuan, eastern Guizhou, northern Guangxi, etc.; the precipitation was 50% to 100% more than historical average in parts of southern Heilongjiang, northwestern Jilin, southwestern Anhui, etc.; the precipitation was 20%~50% less than historical average in central and southern Xinjiang, western Gansu, western Inner Mongolia, central and northern Qinghai, and western Tibet etc.; the precipitation in most other parts of the country was close to the historical average.

Sea level The sea level in China's coastal areas has been going upward with fluctuations. In 2020, China's coastal sea level was 73 mm higher than the historical average, marking the third highest since 1980. The sea level in the past 10 years had been at a high level in the past four decades. From 1980 to 2020, the sea level rising rate in China's coastal areas stood

at 3.4 mm/year.

Carbon intensity Based on preliminary calculations, the CO_2 emissions per unit GDP in 2020 has decreased by 1.0% compared with that of 2019 and decreased by 18.8% compared with that of 2015, exceeding the goal of a reduction of 18% set in the 13th "Five-Year" Plan.

Greenhouse gas In 2019*, the average concentrations of CO_2, CH_4 and N_2O in Qinghai Waliguan Station were 411.4±0.3 ppm, 1,930 ± 2 ppb and 332.6 ± 0.1 ppb respectively. The annual average absolute increments over the past 10 years were 2.40 ppm, 7.7 ppb, and 0.95 ppb respectively.

Natural disaster

Meteorological disaster In 2020, China's meteorological disasters were generally slight compared with that of historical average.

In 2020, heavy rains and flood disasters were generally heavier than the historical average. A total of 37 heavy rains occurred throughout the country, with a high degree of overlap of rain areas during the flood season. The southern China experienced the most severe floods in summer since 1998, and there were 11 regional torrential rains across the country in autumn.

In 2020, drought across the country was lighter than that of historical average, but regional and periodic droughts were evident. From mid-April to early summer, many places north to the Yangtze River experienced periodical drought; in spring and summer, some areas in southwestern China experienced meteorological drought, and the northeast and southern China encountered severe summer drought; in autumn and winter, southern China and other places experienced drought.

Fewer typhoon were generated and made landfall in 2020. There were 23 typhoons in the Northwest Pacific and South China Sea (maximum wind force near the center ⩾ 8), 2.5 fewer than the average year (25.5), and 5 of them landed in China, 2.2 fewer than the average year (7.2).

The temporal and spatial distribution of strong convective weather was relatively concentrated. A total of 56 severe convective weather processes had occurred throughout the country, apparently more than the average of the past five years. Strong convective weather processes in northern China mainly occurred from May to June, causing disasters such as strong winds and hail; strong convective weather processes in southern China mainly occurred from July to August, causing disasters such as short-term heavy rainfall and thunderstorms.

In 2020, there were many high-temperature days, and the strong extreme high temperature occurred in southern China. There were 8.0 days with national average high temperature (daily maximum temperature ⩾ 35°C), 1.1 days more than the same period of the historical average. In summer, the daily maximum temperature of 35 stations across the country exceeded the historical extreme value, of which 33 stations were in southern China.

In 2020, the low temperature damages and snow disasters were lighter than the historical average. In January, there were 4 large-scale rain and snow weather processes in the central and eastern parts of China; in mid-February, a large-scale nationwide cold wave process occurred; in April, heavy snowstorms occurred in northeastern Inner Mongolia and western Heilongjiang (some parts even encountered heavy snowstorms), accompanied by strong winds and cold waves; In November, there was a process of heavy rain and snow in Northeast China; in December, there were two cold air processes that affected China.

In spring of 2020, there was little sand and dust weather in northern China, consequently causing light impact. A total of 7 occurrences of sand and dust weather appeared in northern China, 10 fewer than that of the same period of previous years (17). The average number of dusty days in northern China was 2.6 days, 2.4 days less than the same period of previous years. The first sand and dust weather in 2020 took place on February 13th, 4 days earlier than the 2000-2019 average (February 17th) and 34 days earlier than 2019 (March 19th).

Earthquake In 2020, there were 28 occurrences of earthquakes at or above 5.0 Richter Scale (20 happened in Mainland China, and 8 happened in Taiwan and in the Straits). The strongest earthquake ranking 6.6 Richter Scale occurred on July 23rd in Nyima County, Tibet. Five earthquake disasters happened in Mainland China.

Geological disaster In 2020, 7,840 various kinds of geological disasters happened across the country, an increase of 26.8% over 2019 and an increase of 13.3% over the average of the past five years. In specific, there were 4,810 landslides, 1,797 collapses, 899 mudslides, 183 ground collapses, 143 ground fissures and 8 ground subsidence.

Forest disaster In 2020, a total of 12.7845 million hectares of forests across the country suffered from forest hazards, up by 3.4% compared with that of 2019, among

*Up to the time this Report was published, the monitoring results of the greenhouse gas in 2019 were the latest data.

which 7.9062 million hectares forests were affected by insect pest hazards, down by 2.6% compared with that of 2019; 2.9514 million hectares forests were affected by forest disease, up by 28.6%; 1.74 million hectares forests were affected by forest rat and rabbit hazards, down by 2.3%; 186,800 hectares forest were affected by hazardous plants, up by 5.3% compared with that of 2019.

In 2020, a total of 1,153 cases of forest fire took place across the country. In specific, 7 were big forest fires, damaging the forest area of 8,526 hectares, and no especially big forest fire occurred.

Grassland disaster In 2020, a total of 52.6845 million hectares of grassland across the country had been affected by grassland pest hazards.

In 2020, 13 cases of grassland fires took place across the country, with no occurrence of big and especially big grassland fire, damaging the area of 11,046 hectares of grassland.

Infrastructure and Energy

Infrastructure

Industrial flue gas In 2019*, out of the 146,844 flue gas-related enterprises surveyed by the National Environmental Statistics, 114,595 enterprises had installed flue gas treatment facilities, totaling 315,586 sets. In specific, there were 46,269 sets of desulfurization facilities with an average desulfurization efficiency of 95.9%; 27,699 sets of denitrification facilities with an average denitration efficiency of 79.1%; 162,799 sets of dust removal facilities with an average de-dusting efficiency of 99.5%.

Industrial wastewater In 2019**, out of the 78,447 wastewater-related enterprises surveyed by the National Environmental Statistics, 58,047 enterprises had installed wastewater treatment facilities, totaling 69,200 sets. The capacity of wastewater treatment facilities was 171.95 million ton/day.

Sewage According to preliminary calculation, by the end of 2020, the urban sewage treatment capacity across the country reached 190 million m^3/day, and the sewage treatment volume reached 55.92 billion m^3. The sewage treatment rate achieved 97.08%. The elimination of black and odorous water bodies in built-up areas in APL cities reached 98.2%.

Refuse Based on preliminary accounting, by the end of 2020, the decontamination capacity of urban refuse across the country was 897,700 ton/day, and the decontamination rate of urban refuse reached 99.32%. The percentage of administrative villages with the capacity of collecting, transporting and processing domestic waste in rural areas exceeded 90%. Rectification had been completed for more than 99.95% of the 24,000 non-official dumps across the country.

Hazardous waste By the end of 2019***, the national centralized utilization and disposal capacity of hazardous waste exceeded 110 million tons per year, and the utilization and disposal capacity doubled and was 1.6 times higher than those at the end of 2015.

Agricultural non-point sources In 2020, the utilization rate of fertilizers for the three major food crops of rice, corn and wheat was 40.2%. The utilization rate of pesticides was 40.6%. The comprehensive utilization rate of livestock manure was 75.0%. The national comprehensive utilization rate of straw was 86.7%. The national recovery rate of agricultural film was 80.0%.

Energy

Based on preliminary accounting, the total consumption of primary energy across the country in 2020 was 4.98 billion tons coal equivalent, up by 2.2% compared with that of 2019. Among them, coal consumption went up by 0.6%, crude oil up by 3.3%, natural gas up by 7.2%, and electricity up by 3.1%. Coal consumption took up 56.8% of total energy consumption, down by 0.9 percentage point compared with that of 2019. The consumption of clean energy such as natural gas, hydro-power, nuclear power and wind power took up 24.3% of the total energy consumption volume, up by 1.0 percentage point compared with that of 2019. The national energy consumption per 10,000 yuan GDP**** went down by 0.1% compared with that of 2019.

*Up to the time this Report was published, the indicators in relation to industrial flue gas in 2019 were the latest data.

**Up to the time this Report was published, the indicators in relation to industrial wastewater in 2019 were the latest data.

***Up to the time this Report was published, the indicators in relation to hazardous waste in 2019 were the latest data.

****The energy consumption per 10,000 yuan GDP is calculated at the 2015 price.

The output and growth rate of major energy products in 2020*

Product name	Unit	Output	Change compared with that of 2019 (%)
Total output of primary energy	100 million t coal equivalent	40.8	2.8
Raw coal	100 million t	39.0	1.4
Crude oil	10 thousand t	19,476.9	1.6
Natural gas	100 million m^3	1,925.0	9.8
Power generation	100 million kW·h	77,790.6	3.7
Thermal**	100 million kW·h	53,302.5	2.1
Hydro	100 million kW·h	13,552.1	3.9
Nuclear power	100 million kW·h	3,662.5	5.1

*The output data of some products in 2019 has been verified and adjusted, and the output growth rate in 2020 is calculated on a comparable basis.

**Thermal power includes coal-fired power generation, oil-fired power generation, gas-fired power generation, waste heat, residual pressure, waste gas power generation, waste incineration power generation, and biomass power generation.

Data Sources and Explanations for Assessment

The data in the current report is dominated by the monitoring data of Environmental Monitoring Network of Ministry of Ecology and Environment. Meanwhile, the report absorbed the environmental data provided by relevant ministries and commissions.

As of 2020, Environmental Monitoring Network of Ministry of Ecology and Environment included the national ambient air quality monitoring of 1,436 sites covering 337 APL cities; around 1,000 precipitation monitoring sites in 465 cities (districts and counties) (including 337 APL cities and some county-level cities); the assessment, examination and ranking of 1,937 water sections (sites) covering 978 rivers and 112 lakes (reservoirs); 902 centralized drinking water source monitoring sections (sites) in 336 APL cities; 1,350 national environmental monitoring sites for seawater environmental quality; 442 in-situ sea pollution sources with a daily discharge volume of more than 100 ton; 2,583 ecological and environmental quality monitoring counties in 31 provinces (autonomous regions and municipalities); around 80,000 urban acoustic environment monitoring sites in 337 APL cities; 1,416 environmental ionizing radiation monitoring sites in 337 APL cities and 44 environmental electromagnetic radiation monitoring sites in 31 municipalities and provincial capital cities, as well as the remote sensing data from GF-1, GF-2 and ZY-3 satellites and MODIS data.

The information of 10,171 groundwater monitoring sites for water quality, sea level, geological disasters were provided by Ministry of Natural Resources; the data on sewage treatment and refuse disposal were provided by Ministry of Housing and Urban-Rural Development; the data on water quality of 10,242 groundwater monitoring sites and water and soil erosion were provided by Ministry of Water Resources. The data on water quality of inland fishery waters, marine fishery waters, cultivated land quality, and agricultural non-point sources were provided by Ministry of Agriculture and Rural Affairs. Part of the content of flood and drought disasters, earthquake disasters, forest fires, and grasslands fires were provided by Ministry of Emergency Management; energy data were provided by National Bureau of Statistics; temperature, precipitation, greenhouse gases and meteorological disasters data were provided by China Meteorological Administration; data on desertification and sandification, forest status, grassland status, protected natural areas, forest biological disasters, grassland biological disasters were provided by State Forestry and Grassland Administration.

The assessment of urban ambient air quality was based on the *Ambient Air Quality Standard (GB 3095-2012)*, *Technical Specifications for Environmental Air Quality Assessment (Trial) (HJ 663-2013)*, *the Supplementary Provisions on Urban Air Quality Assessment Affected by Sandstorm Weather Process* and *Letter on Issues Related to Excluding the Impact of Sandy and Dusty Weather*. *The assessment of surface water quality was based on Environmental Quality Standards for Surface Water (GB 3838-2002)* and *the Measures on assessment of Surface Water Quality (Trial)*. The assessment of water quality of centralized drinking water source areas of cities at or above prefecture level was based on *Environmental Quality Standards for Surface Water (GB 3838-2002)* and *Quality Standard for Groundwater (GB/T 14848-2017)*. The assessment of the quality of groundwater was based on *Quality Standard for Groundwater (GB/T 14848-2017)*. The evaluation of the water ecological status of key river basins was based on *Technical Guidelines for Water Eco-environmental Quality Monitoring and Evaluating of River and Stream* and *Technical Guidelines for Water Eco-environmental Quality Monitoring and Evaluating of Lake and Reservoir*. The seawater quality assessment was based on *Technical Regulations for Seawater Quality Assessment (Trial) and Sea Water Quality Standard (GB 3097-1997)*. The assessment of eco-environmental quality was based on *Technical Criterion for Ecosystem Status Evaluation (HJ 192-2015)*. The assessment of acoustic environment was based on *Environmental Quality Standard for Noise (GB 3096-2008)* and *Technical Specifications for Environmental Noise Monitoring-Routine Monitoring for Urban Environmental Noise (HJ 640-2012)*. The assessment of radiation environment quality was based on *Standards for Drinking Water Quality (GB 5749-2006), Sea Water Quality Standard (GB 3097-1997)* and *Electromagnetic Environment Control Limits (GB 8702-2014)*. The distribution of straw burning fire points was based on *Technical Specification for Straw Burning Monitoring Based on Satellite Remote Sensing (HJ 1008-2018)*, and that of human activities in nature reserves was based on *Technical Guidelines for Remote Sensing Monitoring of Human Activities in Nature Reserves (Trial)* and *Measures for Remote Sensing Monitoring and Verification of Human Activities in Nature Reserves (Trial)*. The rounding off for data was based on *the Rules of Rounding off for Numerical Value and Expression and Judgment of Limiting Values (GB/T 8170-2008)*.

Censor code: No. GS (2021) 2666

Note: National data in the current Report do not cover Hong Kong SAR, Macao SAR and Taiwan Province except that on administrative zoning, national land area and earthquake disasters.

Contributors to the 2020 Report on the State of the Ecology and Environment in China

Leading Department

Ministry of Ecology and Environment

Contributing Ministries and Administrations

National Development and Reform Commission

Ministry of Natural Resources

Ministry of Housing and Urban–Rural Development

Ministry of Transport

Ministry of Water Resources

Ministry of Agriculture and Rural Affairs

National Health Commission

Ministry of Emergency Management

National Bureau of Statistics

China Meteorological Administration

State Forestry and Grassland Administration