

中国水旱灾害防御公报

China Flood and Drought Disaster Prevention Bulletin

2025

中华人民共和国水利部

Ministry of Water Resources of the People's Republic of China



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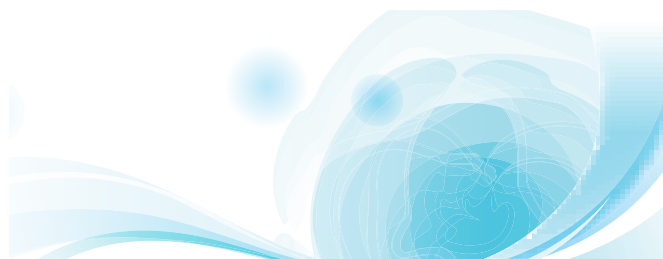
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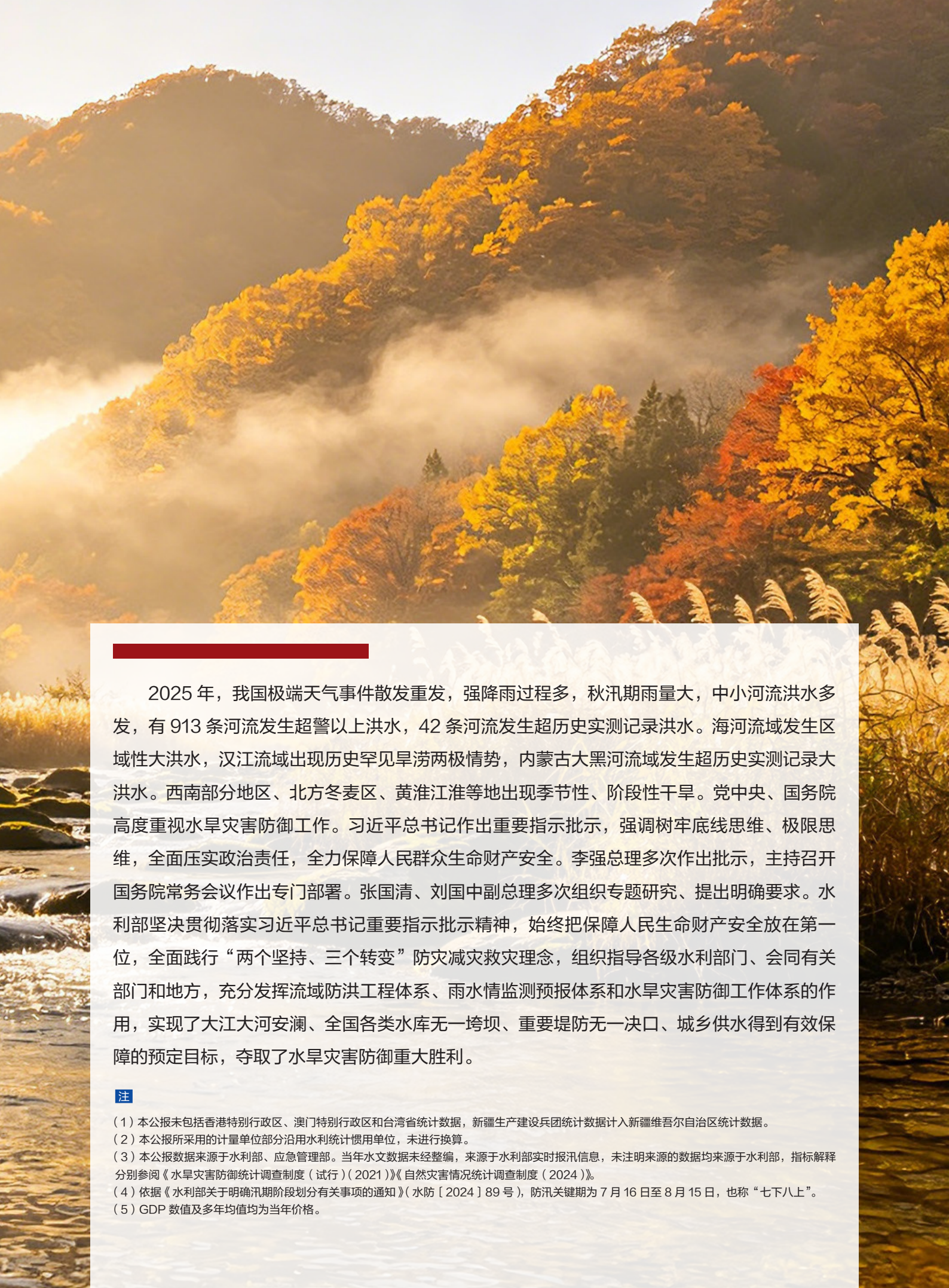
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2025 年，我国极端天气事件散发重发，强降雨过程多，秋汛期雨量大，中小河流洪水多发，有 913 条河流发生超警以上洪水，42 条河流发生超历史实测记录洪水。海河流域发生区域性大洪水，汉江流域出现历史罕见旱涝两极情势，内蒙古大黑河流域发生超历史实测记录大洪水。西南部分地区、北方冬麦区、黄淮江淮等地出现季节性、阶段性干旱。党中央、国务院高度重视水旱灾害防御工作。习近平总书记作出重要指示批示，强调树牢底线思维、极限思维，全面压实政治责任，全力保障人民群众生命财产安全。李强总理多次作出批示，主持召开国务院常务会议作出专门部署。张国清、刘国中副总理多次组织专题研究、提出明确要求。水利部坚决贯彻落实习近平总书记重要指示批示精神，始终把保障人民生命财产安全放在第一位，全面践行“两个坚持、三个转变”防灾减灾救灾理念，组织指导各级水利部门、会同有关部门和地方，充分发挥流域防洪工程体系、雨水情监测预报体系和水旱灾害防御工作体系的作用，实现了大江大河安澜、全国各类水库无一垮坝、重要堤防无一决口、城乡供水得到有效保障的预定目标，夺取了水旱灾害防御重大胜利。

注

- (1) 本公报未包括香港特别行政区、澳门特别行政区和台湾省统计数据，新疆生产建设兵团统计数据计入新疆维吾尔自治区统计数据。
- (2) 本公报所采用的计量单位部分沿用水利统计惯用单位，未进行换算。
- (3) 本公报数据来源于水利部、应急管理部。当年水文数据未经整编，来源于水利部实时报讯信息，未注明来源的数据均来源于水利部，指标解释分别参阅《水旱灾害防御统计调查制度（试行）（2021）》《自然灾害情况统计调查制度（2024）》。
- (4) 依据《水利部关于明确汛期阶段划分有关事项的通知》（水防〔2024〕89 号），防汛关键期为 7 月 16 日至 8 月 15 日，也称“七下八上”。
- (5) GDP 数值及多年均值均为当年价格。

In 2025, China experienced dispersed and severe extreme weather events: Heavy rain events were frequent, the autumn flood season was lashed with torrents, leading to frequent flooding in small and medium-sized rivers. A total of 913 rivers experienced floods above warning level, and 42 rivers experienced floods that broke historical measurements. The Haihe River Basin experienced a large regional flood, the Hanjiang River Basin experienced a rare dual strike of drought and flooding, and the Dahei River Basin in Nei Mongol experienced a record-breaking flood. Seasonal and phased droughts occurred in parts of Southwest China, the northern winter wheat-growing regions, and the Huang-Huai and Jiang-Huai regions. The central government of China attached great importance to flood and drought disaster prevention. President Xi Jinping issued key directives, emphasizing the need to establish a bottom-line mindset, prepare for the worst-case scenarios, fully enforce political responsibilities, and spare no effort to safeguard the lives and property of the people. Premier Li Qiang issued instructions and convened an executive meeting of the State Council to make specific arrangements. Vice Premiers Zhang Guoqing and Liu Guozhong organized study sessions to map out clear actions. The Ministry of Water Resources (hereinafter MWR) thoroughly and forcefully executed the instructions of President Xi Jinping, and put the safety of people's lives and properties in the first place. It upheld the people-centered approach and scientific prevention and control, and shifted the focus from disaster relief to comprehensive disaster prevention, from post-disaster response to pre-disaster preparedness, and from risk mitigation to hazard management. The Ministry organized and guided local water resources departments and collaborated with relevant parties to fully leverage the functions of the river basin flood control infrastructure, the rainfall and hydrological monitoring and forecasting system, and the flood and drought disaster prevention work system. This has ensured successful flood and drought prevention outcomes in 2025: the safety of major rivers was protected, no reservoir dams collapsed, no major embankments were broken, and urban and rural water supplies were secured.

Notes

(1) This Bulletin does not include statistical data of the Hong Kong Special Administrative Region, the Macao Special Administrative Region, and Taiwan Province; statistical data of the Xinjiang Production and Construction Corps are included in the statistics for the Xinjiang Uygur Autonomous Region.

(2) Some of the units of measurement used in this Bulletin conform to what are customarily used in water conservancy sector and have not been converted.

(3) The data in this Bulletin are sourced from the Ministry of Water Resources (MWR) and the Ministry of Emergency Management (MEM). Hydrological data for the current year have not been compiled and are derived from real-time flood reporting information provided by the MWR. Data without specified sources are all from the MWR. Interpretations on the indicators can be found in *Statistical Investigation System for Flood and Drought Disaster Prevention (Trial)* (2021) and *Statistical Investigation System for Natural Disasters* (2020), respectively.

(4) According to the *Notice of the Ministry of Water Resources on Clarifying Matters Related to the Division of Flood Season Stages* (Shuifang [2024] No.89), the critical flood prevention period is from July 16 to August 15, also known as the "late July-early August" period.

(5) GDP figures and multi-year averages are expressed in current-year prices.



雨水情

RAINFALL AND WATER REGIME





1.1 雨情

2025 年，全国面降水量 644 毫米，较常年（625 毫米）偏多 3%。其中，黄河、海河流域降水量偏多 3 ~ 4 成，淮河流域降水量偏多 1.3 成，其他流域降水量接近常年。5—9 月，全国面降水量 481 毫米，较常年同期（453 毫米）偏多 6%，其中，黄河、海河、珠江、太湖流域偏多 2 ~ 3 成，其他流域接近常年同期。全国雨情有 3 个主要特点。

（1）强降雨过程多，北方局地暴雨强度大。全年共发生强降雨过程 38 次，较常年偏多 4 次。北方局地暴雨强度大，7 月 23—29 日海河流域中部北部降雨过程有 12 个站点日降雨量突破历史实测记录，31 个站点突破建站以来 7 月历史实测记录，最大 24 小时降雨量河北保定易县 449 毫米（7 月 24 日），最大 1 小时降雨量河北保定阜平县柏崖村 136 毫米（25 日 18—19 时）；甘肃榆中县峡口村 8 月 7 日强降雨过程最大 6 小时、最大 12 小时降雨量分别达 109 毫米和 158 毫米，为历史实测记录的 2 倍和 2.3 倍。

（2）秋汛期降雨量大，汉江等流域降雨超历史。秋汛期全国面降水量 168 毫米，较常年同期（123 毫米）偏多 37%，列 1961 年有实测记录以来第 1 位。黄河流域面降雨量 286 毫米，较常年同期（127 毫米）偏多 1.3 倍，列 1961 年有实测记录以来第 2 位；淮河流域面降雨量 412 毫米，较常年同期（164 毫米）偏多 1.5 倍，列 1961 年有实测记录以来第 1 位；海河流域面降雨量 261 毫米，较常年同期（103 毫米）偏多 1.5 倍，列 1961 年有实测记录以来第 2 位。汉江上游共发生 15 次强降雨过程，累计面降雨量 634 毫米，较常年同期（229 毫米）偏多 1.8 倍，列 1961 年有实测记录以来第 1 位。

（3）台风带来降雨多，海河珠江流域影响大。全年共生成台风 27 个，较常年（25.1 个）偏多 1.9 个，其中登陆 10 个，较常年（7.1 个）偏多 2.9 个。7 月 24—29 日，受台风“范斯高”“竹节草”影响，京津冀地区累计降水量

100 毫米以上覆盖面积 14.8 万平方千米，约占总面积的 68%，最大过程点雨量北京密云区上甸子 482.4 毫米、河北兴隆县 540.7 毫米。9 月下旬至 10 月上旬，台风“桦加沙”“博罗依”“麦德姆”接连影响华南，“桦加沙”3 次登陆，“麦德姆”2 次登陆，珠江流域累计面降雨量 137 毫米，较常年同期（64 毫米）偏多 1.1 倍，其中郁江、盘龙江流域累计面降雨量分别为 290 毫米、212 毫米，较常年同期（50 毫米、49 毫米）分别偏多 4.8 倍和 3.3 倍，均列 1961 年有实测记录以来第 1 位。

1.1 Rainfall

In 2025, the average annual precipitation in China was 644 mm, 3% higher than normal (625 mm). Precipitation in the Yellow River and the Haihe River basins were 30%–40% higher than normals, while precipitation in the Huaihe River basin was 13% higher than normal; precipitation in other basins was close to their normals. From May to September, the national average precipitation totaled 481 mm, 6% higher than normal over the same period (453 mm); Precipitation in the Yellow River, Haihe River, Pearl River, and Taihu Lake basins were 20%–30% higher than normals, while precipitation in other basins were close to their normals. In general, rainfall in 2025 took on the following three characteristics:

(1) Frequent heavy rainfall processes with intense localized rainstorms in the north. A total of 38 heavy rainfall processes occurred throughout the year (4 more than normal). The North experienced intense localized rainstorms; During the rainstorm event in the central and northern Haihe River Basin from July 23 to 29, daily rainfall amounts at 12 stations exceeded historical records, and 31 stations saw new rainfall records over July. The maximum 24-hour rainfall amount of 449 mm occurred in Yixian County, Baoding, Hebei Province (July 24), and the maximum 1-hour rainfall amount of 136 mm occurred in Baiya Village, Fuping County, Baoding, Hebei Province (between 18:00 and 19:00 on the 25th); during the heavy rainfall event on August 7 in Xiakou Village, Yuzhong County, Gansu Province, the maximum 6-hour and 12-hour rainfall amounts reached 109 mm and 158 mm respectively, which were 2 times and 2.3 times the historical records, respectively.

(2) Heavy rainfall during the autumn flood season, with rainfall amounts in the Hanjiang River basin exceeding historical records. The national average rainfall during the autumn flood season was 168 mm, 37% higher than normal over the same period (123 mm) and beating the measured record since 1961. Rainfall amounts in the Yellow River basin were 286 mm, 1.3 times the normal over the same period (127 mm) and ranking second in post-1961 record;

rainfall amounts in the Huaihe River basin were 412 mm, 1.5 times the normal over the same period (164 mm) and beating the record since 1961; rainfall amounts in the Haihe River basin totaled 261 mm, 1.5 times the normal over the same period (103 mm) and ranking second in post-1961 record; the upper Hanjiang River experienced 15 heavy rainfall processes, with cumulative rainfall amounts of 634 mm, 1.8 times the normal over the same period (229 mm) and beating the measured record since 1961.

(3) Heavy rainfall brought by typhoon landfalls with the Haihe and Pearl River basins being strongly affected. A total of 27 typhoons formed during the year, 1.9 times the normal (25.1). Among them, 10 made landfall in China, surpassing the normal (7.1) by 2.9. From July 24 to 29, affected by typhoon Francisco and typhoon Co-may, almost 68% of the Beijing-Tianjin-Hebei region—148,000 km² in total—received cumulative precipitation of over 100 mm. The maximum point rainfall in a single process was recorded at Shangdianzi in Miyun District, Beijing (482.4 mm) and Xinglong County, Hebei (540.7 mm), respectively. From late September to early October, South China was successfully affected by typhoons Ragasa, Bualoi, and Matmo. Typhoon Ragasa made landfall three times and typhoon Matmo twice. The cumulative rainfall in the Pearl River Basin was 137 mm, 1.1 times the normal over the same period (64 mm). In particular, the Yujiang and Panlong river basins recorded cumulative rainfall of 290 mm and 212 mm, respectively, which were 4.8 times and 3.3 times their normals (50 mm and 49 mm, respectively) and ranked first since records began in 1961.

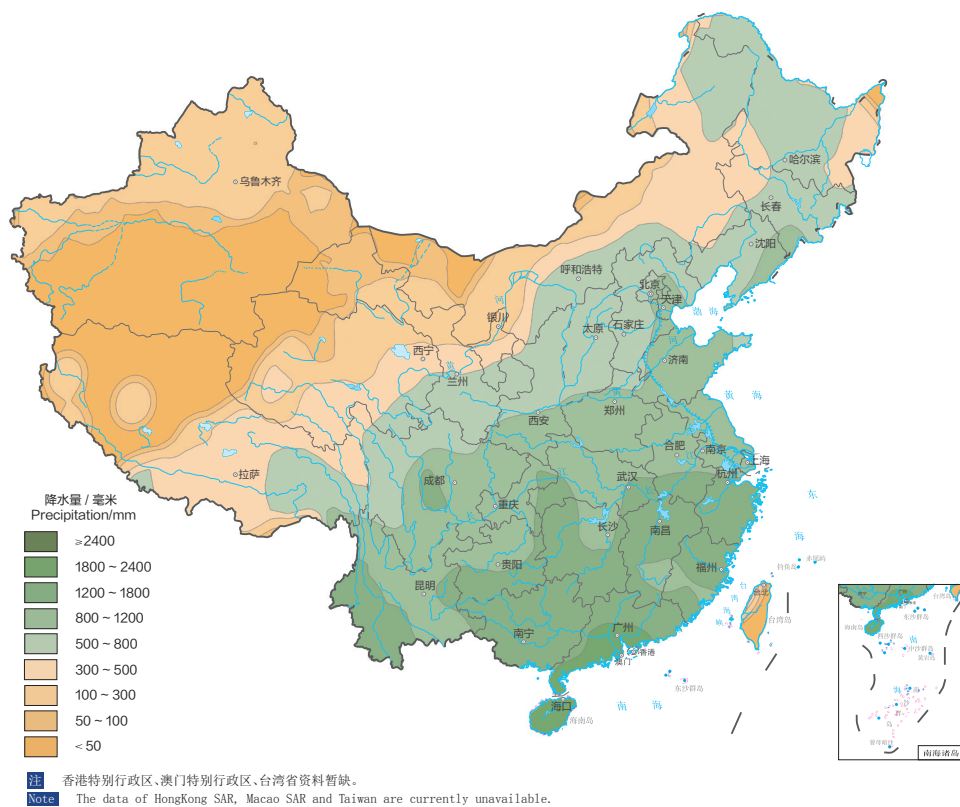


图 1-1 2025 年全国面降水量等值线图

Figure 1-1 Isogram of precipitation nationwide in 2025

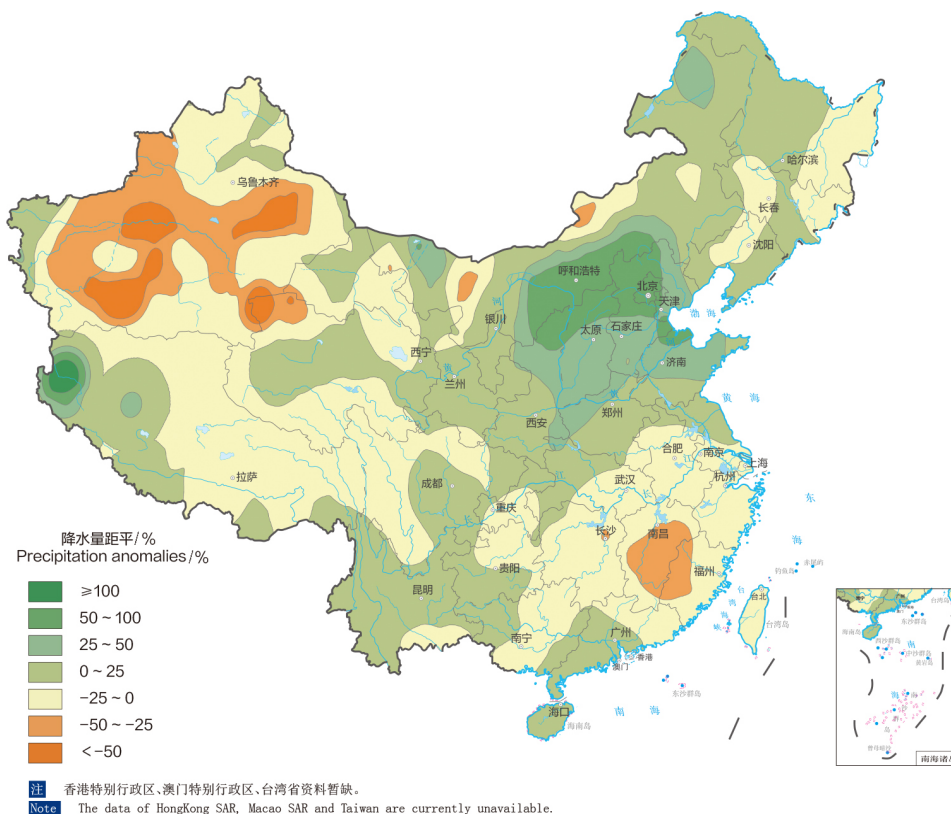


图 1-2 2025 年全国面降水量距平图

Figure 1-2 Precipitation anomalies in 2025

乌鲁木齐 Urumqi
 拉萨 Lhasa
 西宁 Xining
 银川 Yinchuan
 兰州 Lanzhou
 呼和浩特 Hohhot
 哈尔滨 Harbin
 长春 Changchun
 沈阳 Shenyang
 北京 Beijing
 天津 Tianjin
 石家庄 Shijiazhuang

太原 Taiyuan
 济南 Ji'nan
 郑州 Zhengzhou
 西安 Xi'an
 武汉 Wuhan
 南京 Nanjing
 上海 Shanghai
 杭州 Hangzhou
 合肥 Hefei
 南昌 Nanchang
 福州 Fuzhou
 长沙 Changsha
 重庆 Chongqing
 成都 Chengdu
 贵阳 Guiyang
 广州 Guangzhou
 昆明 Kunming
 南宁 Nanning
 海口 Haikou
 澳门 Macao
 香港 Hong Kong
 台北 Taibei
 海南岛 Hainan Dao
 台湾岛 Taiwan Dao
 钓鱼岛 Diaoyu Dao
 赤尾屿 Chiwei Yu
 渤海 Bo Hai
 黄海 Yellow Sea
 东海 East China Sea
 南海 South China Sea
 台湾海峡 Taiwan Haixia
 南海诸岛 Nanhai Zhudao
 东沙群岛 Dongsha Qundao
 南沙群岛 Nansha Qundao
 中沙群岛 Zhongsha Qundao
 西沙群岛 Xisha Qundao
 黄岩岛 Huangyan Dao
 曾母暗沙 Zengmu Ansha

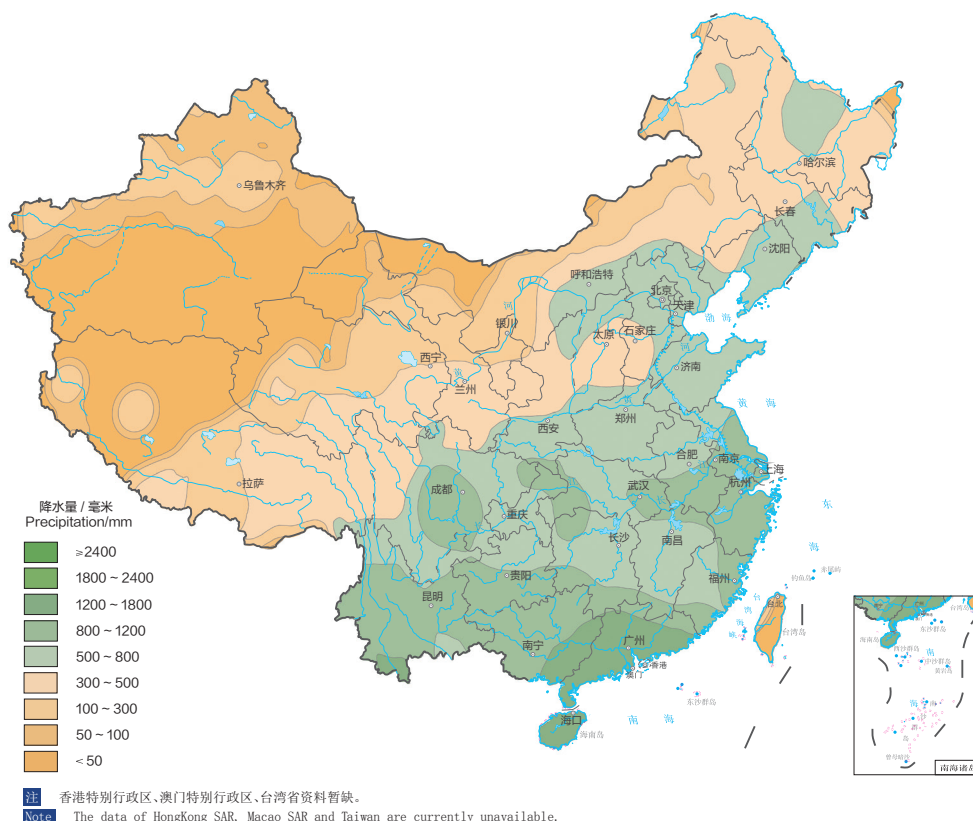


图 1-3 2025 年 5—9 月全国面降水量等值线图

Figure 1-3 Isogram of precipitation nationwide for May to September, 2025

乌鲁木齐 Urumqi
 拉萨 Lhasa
 西宁 Xining
 银川 Yinchuan
 兰州 Lanzhou
 呼和浩特 Hohhot
 哈尔滨 Harbin
 长春 Changchun
 沈阳 Shenyang
 北京 Beijing
 天津 Tianjin
 石家庄 Shijiazhuang
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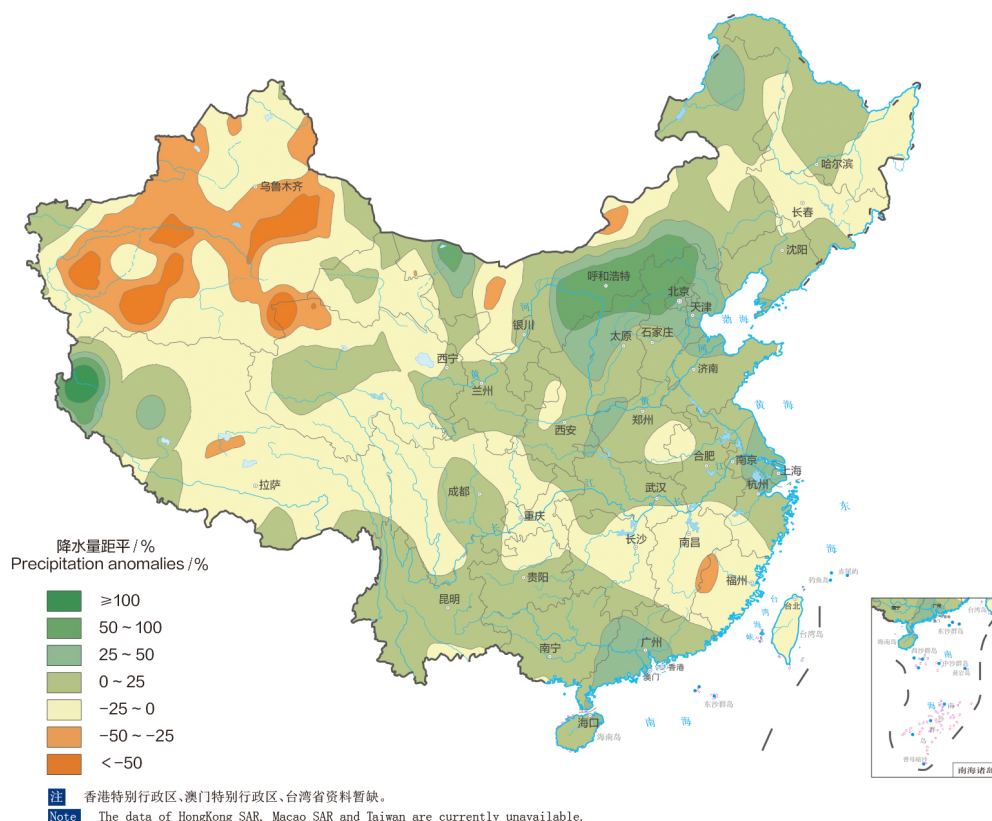


图 1-4 2025 年 5—9 月全国面降水量距平图

Figure 1-4 Precipitation anomalies nationwide from May to September, 2025



1.2 水情

1.2.1 江河径流量

2025 年，全国主要江河径流量 11073.4 亿立方米，较常年偏少 2 成。长江大通站 6980.5 亿立方米，偏少 2 成。黄河花园口站 408.8 亿立方米，持平略偏多。淮河鲁台子站 130.0 亿立方米，偏少 3 成。海河流域永定河三家店站 21.2 亿立方米，偏多 63.0 倍；拒马河张坊站 6.6 亿立方米，偏多 4.2 倍；子牙河北中山站 7.7 亿立方米，偏多 7.3 倍。珠江流域西江梧州站 1993.0 亿立方米，偏少 1 成；北江石角站 372.9 亿立方米，偏少 1 成；东江博罗站 209.5 亿立方米，偏少 1 成。松花江佳木斯站 546.8 亿立方米，偏多 1 成。辽河铁岭站 34.7 亿立方米，偏多 1 成。

汛前，主要江河径流量及与常年同期相比，长江大通站 1422.7 亿立方米，偏少 2 成。黄河花园口站 120.2 亿立方米，偏多近 2 成。淮河鲁台子站 13.6 亿立方米，偏少 6 成。海河流域永定河三家店站 2.1 亿立方米，偏多 17 倍；拒马河张坊站 0.8 亿立方米，偏多 3 倍；子牙河北中山站 0.5 亿立方米，偏多 7 倍。珠江流域西江梧州站 223.5 亿立方米，偏少 2 成；北江石角站 37.8 亿立方米，偏少 6 成；东江博罗站 42.3 亿立方米，偏少 2 成。松花江佳木斯站 172.0 亿立方米，偏多 5 成。辽河铁岭站 13.2 亿立方米，偏多 2 倍。

注

(1) 全国主要江河累计径流量以代表站累计径流量之和计算，非出口断面累计径流量之和。

(2) 黄河、海河、松花江、辽河流域径流量统计时段划分：汛前（1—5 月）、汛期（6—9 月）、汛后（10—12 月）；长江、淮河、珠江及钱塘江、闽江流域径流量统计时段划分：汛前（1—4 月）、汛期（5—9 月）、汛后（10—12 月）。

1.2 Water Regime

1.2.1 River discharge

In 2025, the discharge of main rivers nationwide was 1,107.34 billion m^3 , 20% less than normal. The Datong Station on the Yangtze River recorded 698.05 billion m^3 , 20% less than normal. The Huayankou Station on the Yellow River recorded 40.88 billion m^3 , only slightly more than normal. The Lutaizi Station on the Huaihe River recorded 13.00 billion m^3 , 30% less than normal. In the Haihe River Basin, the Sanjiadian Station on the Yongding River recorded 2.12 billion m^3 , 63.0 times the normal; the Zhangfang Station on the Juma River recorded 660 million m^3 , 4.2 times the normal; and the Beizhongshan Station on the Ziya River recorded 770 million m^3 , 7.3 times the normal. In the Pearl River Basin, the Wuzhou Station on the Xijiang River recorded 199.30 billion m^3 , 10% less than normal; the Shijiao Station on the Beijiang River recorded 37.29 billion m^3 , 10% less than normal; and the Boluo Station on the Dongjiang River recorded 20.95 billion m^3 , 10% less than normal. The Jiamusi Station on the Songhua River recorded 54.68 billion m^3 , 10% more than normal. The Tieling Station on Liaohe River recorded 3.47 billion m^3 , 10% more than normal.

Before the flood season, the discharge of major rivers and the comparison with their respective normals are as follows: the Datong Station on the Yangtze River recorded 142.27 billion m^3 , 20% less; the Huayankou Station on the Yellow River recorded 12.02 billion m^3 , nearly 20% more; the Lutaizi Station on the Huaihe recorded 1.36 billion m^3 , 60% less. In the Haihe River Basin, the Sanjiadian Station on the Yongding River recorded 210 million m^3 , 17 times the normal; the Zhangfang Station on the Juma River recorded 80 million m^3 , 3 times the normal; and the Beizhongshan Station on the Ziya River recorded 50 million m^3 , 7 times the normal. In the Pearl River Basin, the Wuzhou Station on the Xijiang River recorded 22.35 billion m^3 , 20% less; the Shijiao Station on the Beijiang River recorded 3.78 billion m^3 , 60% less; and the Boluo Station on the Dongjiang River recorded 4.23 billion m^3 , 20% less. The Jiamusi Station on the Songhua River recorded 17.20 billion m^3 , 50% more. The Tieling Station on the Liaohe River recorded 1.32 billion m^3 , twice the normal.

Note

(1) The cumulative discharge of major rivers is calculated as the sum of cumulative river discharge at representative stations, not as the sum of cumulative river discharge at outlet cross-sections.

(2) Statistical periods for river discharge in the Yellow River, Haihe River, Songhua River, and Liaohe River basins are divided as: pre-flood season (January–May), flood season (June–September), and post-flood season (October–December); For the Yangtze, Huaihe, Pearl, Qiantang, and Minjiang river basins, the statistical periods for river discharge are divided as: pre-flood season (January–April), flood season (May–September), and post-flood season (October–December).



汛期，主要江河径流量及与常年同期相比，长江大通站 3749.6 亿立方米，偏少 3 成。黄河花园口站 156.3 亿立方米，偏少 2 成。淮河鲁台子站 51.5 亿立方米，偏少 6 成。海河流域永定河三家店站 12.5 亿立方米，偏多 100 倍；拒马河张坊站 3.5 亿立方米，偏多 3 倍；子牙河北中山站 0.3 亿立方米，偏少 5 成。珠江流域西江梧州站 1289.1 亿立方米，偏少 2 成；北江石角站 291.3 亿立方米，偏多 1 成；东江博罗站 131.5 亿立方米，偏少 1 成。松花江佳木斯站 285.8 亿立方米，偏少 1 成。辽河铁岭站 18.3 亿立方米，偏少 2 成。

汛后，主要江河径流量及与常年同期相比，长江大通站 1808.2 亿立方米，偏多 1 成。黄河花园口站 132.3 亿立方米，偏多 3 成。淮河鲁台子站 64.9 亿立方米，偏多 1.2 倍。海河流域永定河三家店站 6.6 亿立方米，偏多 55.9 倍；拒马河张坊站 2.3 亿立方米，偏多 7.4 倍；子牙河北中山站 6.9 亿立方米，偏多 43.2 倍。珠江流域西江梧州站 480.4 亿立方米，偏多 7 成；北江石角站 43.8 亿立方米，偏少 1 成；东江博罗站 35.7 亿立方米，基本持平略偏少。松花江佳木斯站 89.0 亿立方米，偏少 1 成。辽河铁岭站 3.2 亿立方米，基本持平略偏少。

During the flood season, the river discharge of major rivers and the comparison with their respective normals are as follows: the Datong Station on the Yangtze River recorded 374.96 billion m^3 , 30% less; the Huayuankou Station on the Yellow River recorded 15.63 billion m^3 , 20% less; and the Lutaizi Station on the Huaihe recorded 5.15 billion m^3 , 60% less. In the Haihe River Basin, the Sanjiadian Station on the Yongding River recorded 1.25 billion m^3 , 100 times the normal; the Zhangfang Station on the Juma River recorded 350 million m^3 , three times the normal; and the Beizhongshan Station on the Ziya River recorded 30 million m^3 , 50% less. In the Pearl River Basin, the Wuzhou Station on the Xijiang River recorded 128.91 billion m^3 , 20% less; the Shijiao Station on the Beijiang River recorded 29.13 billion m^3 , 10% more; the Boluo Station on the Dongjiang River recorded 13.15 billion m^3 , 10% less. The Jiamusi Station on the Songhua River recorded 28.58 billion m^3 , 10% less. The Tieling Station on the Liaohe recorded 1.83 billion m^3 , 20% less.

After the flood season, the river discharge of major rivers and the comparison with their respective normals are as follows: the Datong Station on the Yangtze River recorded 180.82 billion m^3 , 10% more; the Huayuankou Station on the Yellow River recorded 13.23 billion m^3 , 30% more. The Lutaizi Station on the Huaihe recorded 6.49 billion m^3 , 1.2 times the normal. In the Haihe River Basin, the Sanjiadian Station on the Yongding River recorded 660 million m^3 , 55.9 times the normal; the Zhangfang Station on the Juma River recorded 230 million m^3 , 7.4 times the normal; and the Beizhongshan Station on the Ziya River recorded 690 million m^3 , 43.2 times the normal. In the Pearl River Basin, the Wuzhou Station on the Xijiang River recorded 48.04 billion m^3 , 70% more; the Shijiao Station on the Beijiang recorded 4.38 billion m^3 , 10% less; the Boluo Station on the Dongjiang recorded 3.57 billion m^3 , only slightly less. The Jiamusi Station on the Songhua River recorded 8.90 billion m^3 , 10% less. The Tieling Station on the Liaohe River recorded 320 million m^3 , only slightly less.

1.2.2 Reservoir storage

On June 1, the 9,520 reservoirs that report daily statistics to MWR (hereinafter “key statistical reservoirs”) held 441.92 billion m^3 of water, 11% more than normal over the same period. Among them, the 762 large reservoirs stored 398.21 billion m^3 , 12% more than normal; the 3,405 medium-sized reservoirs stored 39.00 billion m^3 , 1% less than normal; and the 5,353 small reservoirs stored 4.71 billion m^3 , 6% less than normal.

On October 1, the key statistical reservoirs stored 568.53 billion m^3 , 29% more than that on June 1 and 10% more than normal over the same period. Among them, the 762 large reservoirs held 517.59 billion m^3 , 30% more than that on June 1 and 10% more than normal over the same period; the 3,405 medium-sized reservoirs held 46.44 billion m^3 , 19% more than that on June 1 and 5% more than normal over the same period; the 5,353 small reservoirs held 4.50 billion m^3 , 4% less than that on June 1 and 6% less than normal over the same period.

At year-end (January 1, 2026), the key statistical reservoirs held 555.12 billion m^3 , 3% more than that on January 1, 2025 and 13% more than normal over the same period. Among them, the 762 large reservoirs held 507.00 billion m^3 , 3% more than that on January 1, 2025 and 13% more than normal over the same period; the 3,405 medium-sized reservoirs held 43.94 billion m^3 , 3% more than that on January 1, 2025 and 6% more than normal over the same period; and the 5,353 small reservoirs held 4.18 billion m^3 , 7% less than that on January 1, 2025 and 5% more than normal over the same period.

2

汛旱情

FLOODS AND DROUGHTS



2.1 汛情及特点

2025 年 3 月 15 日，我国进入汛期，较常年入汛日期（4 月 1 日）偏早 17 天。汛期共有 913 条河流发生超警戒以上洪水，较常年（811 条）偏多 13%，其中 197 条河流发生超保证洪水、42 条河流发生超历史实测记录洪水，黄河、太湖、滦河分别发生 1 次编号洪水。长江流域（片）有 286 条河流发生超警戒洪水，其中陕西汉江上游干流及支流渭水河、贵州赤水河等 87 条河流发生超保证洪水，陕西渭水河、云南澜沧江支流银江等 11 条河流发生超历史实测记录洪水；黄河流域（片）有 85 条河流发生超警戒洪水，其中陕西渭河支流北洛河、甘肃泾河支流马莲河、新疆塔里木河等 23 条河流发生超保证洪水，新疆玉龙喀什河、内蒙古大黑河支流水磨沟等 5 条河流发生超历史实测记录洪水，黄河干流发生 1 次编号洪水；淮河流域（片）有 26 条河流发生超警戒洪水；海河流域（片）有 28 条河流发生超警戒洪水，其中北京白河、天津洵河等 13 条河流发生超保证洪水，河北潮白河、滦河等 12 条河流发生超历史实测记录洪水，滦河发生 1 次编号洪水；珠江流域（片）有 311 条河流发生超警戒洪水，其中贵州都柳江、广东绥江、云南南盘江等 42 条河流发生超保证洪水，贵州都柳江、广西右江等 11 条河流发生超历史实测记录洪水；松辽流域（片）有 77 条河流发生超警戒洪水，其中吉林大罗圈河、果松川河等 9 条河流发生超保证洪水，黑龙江润津河、刘忠沟等 3 条河流发生超历史实测记录洪水；太湖流域（片）有 100 条河流发生超警戒洪水，其中江苏大运河、陈墅塘等 23 条河流发生超保证洪水，太湖发生 1 次编号洪水。黄河、黑龙江等北方河流凌情平稳。

2.1 Floods and Main Characteristics

The 2025 flood season began on March 15, 2025, which was 17 days earlier than the multi-year average start date (April 1). During the flood season, 913 rivers experienced floods above the warning level, 13% more than the average annual (811 rivers). Among them, 197 rivers had floods above the guaranteed level, and 42 rivers had record-breaking floods. The Yellow River, the Taihu Lake, and the Luanhe River each experienced one numbered flood. In the Yangtze River Basin (region), 286 rivers experienced floods above the warning level. Among them, 87 rivers—including the upper Hanjiang mainstream in Shaanxi Province and its tributary Xushui, as well as the Chishui River in Guizhou Province—experienced floods above the guaranteed level; and 11 rivers—including the Xushui in Shaanxi Province and the Yinjiang, a tributary of the Lancang River in Yunnan Province—experienced floods breaking historical measurements. In the Yellow River Basin (region), 85 rivers experienced floods above the warning level. Among them, 23 rivers—including the Beiluo (a tributary of the Weihe in Shaanxi Province), the Malian (a tributary of the Jinghe in Gansu Province), and the Tarim River in Xinjiang—had floods above the guaranteed level; and 5 rivers—including the Yurungkash River in Xinjiang and the Shuimogou (a tributary of the Dahei River in Nei Mongol)—experienced floods breaking historical measurements; the Yellow River mainstream experienced one numbered flood. In the Huaihe River Basin (region), 26 rivers experienced floods above the warning level. In the Haihe River Basin (region), 28 rivers had floods above the warning level. Among them, 13 rivers—including the Baihe in Beijing and the Juhe in Tianjin—had floods above the guaranteed level; and 12 rivers—

including the Chaobai and the Luanhe in Hebei—had floods breaking historical measurements; and the Luanhe experienced one numbered flood. In the Pearl River Basin (region), 311 rivers experienced floods above the warning level. Among them, 42 rivers—including the Dulu in Guizhou, the Suijiang in Guangdong, and the Nanpan in Yunnan—experienced floods above the guaranteed level; and 11 rivers—including the Dulu in Guizhou and the Youjiang in Guangxi—experienced floods breaking historical measurements. In the Songhua-Liaohe River Basin (region), 77 rivers experienced floods above the warning level. Among them, 9 rivers—including the Daluoquan and Guosongchuan in Jilin—experienced floods above the guaranteed level; and 3 rivers—including the Runjin and Liuzhonggou in Heilongjiang—experienced floods breaking historical measurements. In the Taihu Lake Basin (region), 100 rivers experienced floods above the warning level. Among them, 23 rivers, such as the Grand Canal and the Chenshutang in Jiangsu, experienced floods above the guaranteed level, and Taihu Lake experienced one numbered flood. China's northern rivers, including the Yellow River and the Heilong River, safely passed the ice flood period.

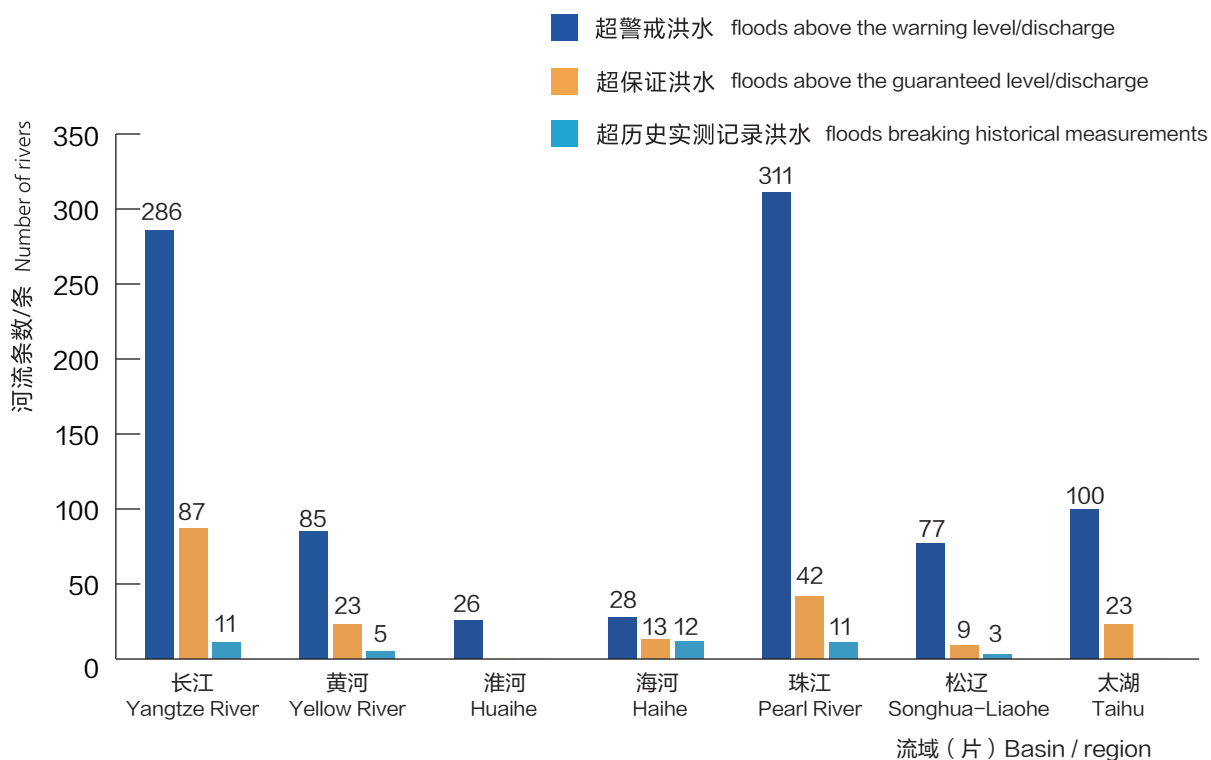


图 2-1 2025 年各流域 (片) 发生超警戒、超保证、超历史实测记录洪水河流条数

Figure 2-1 Number of rivers experiencing floods above the warning water level/discharge, above the guaranteed water level/discharge, and breaking historical measurements in the major river basins/regions in 2025

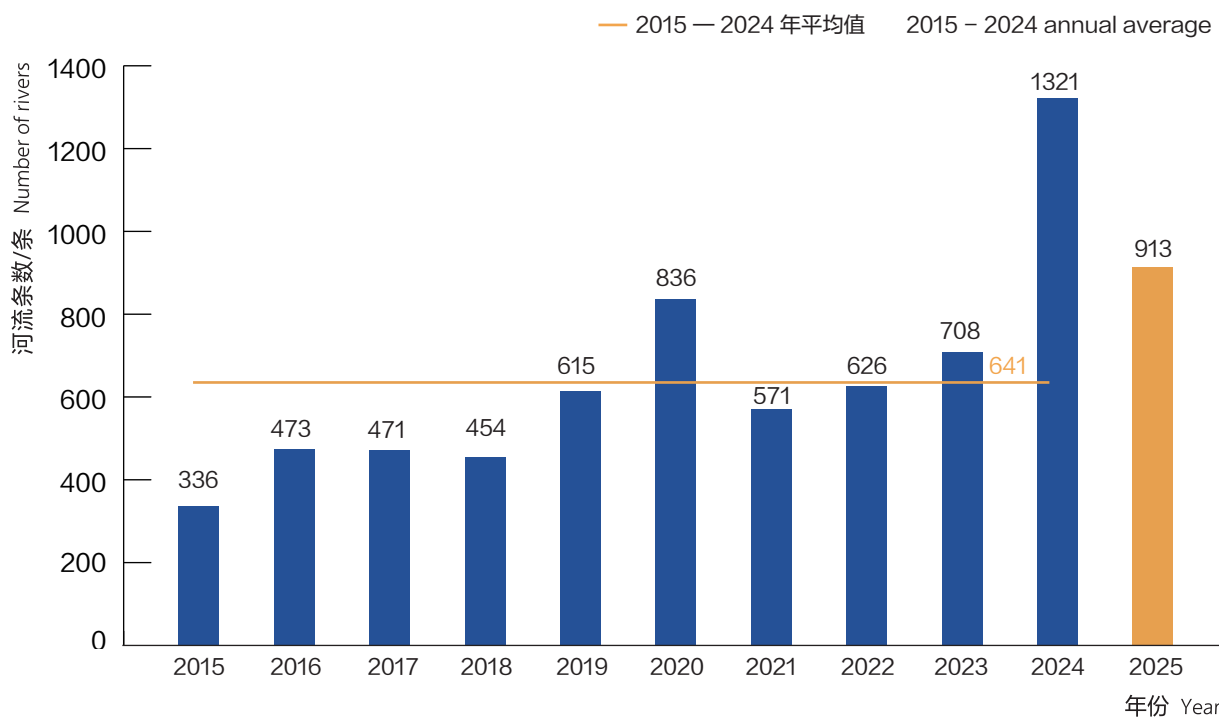


图 2-2 2015—2025 年全国发生超警戒洪水河流条数

Figure 2-2 Number of rivers experiencing floods above the warning level/discharge in China, 2015–2025

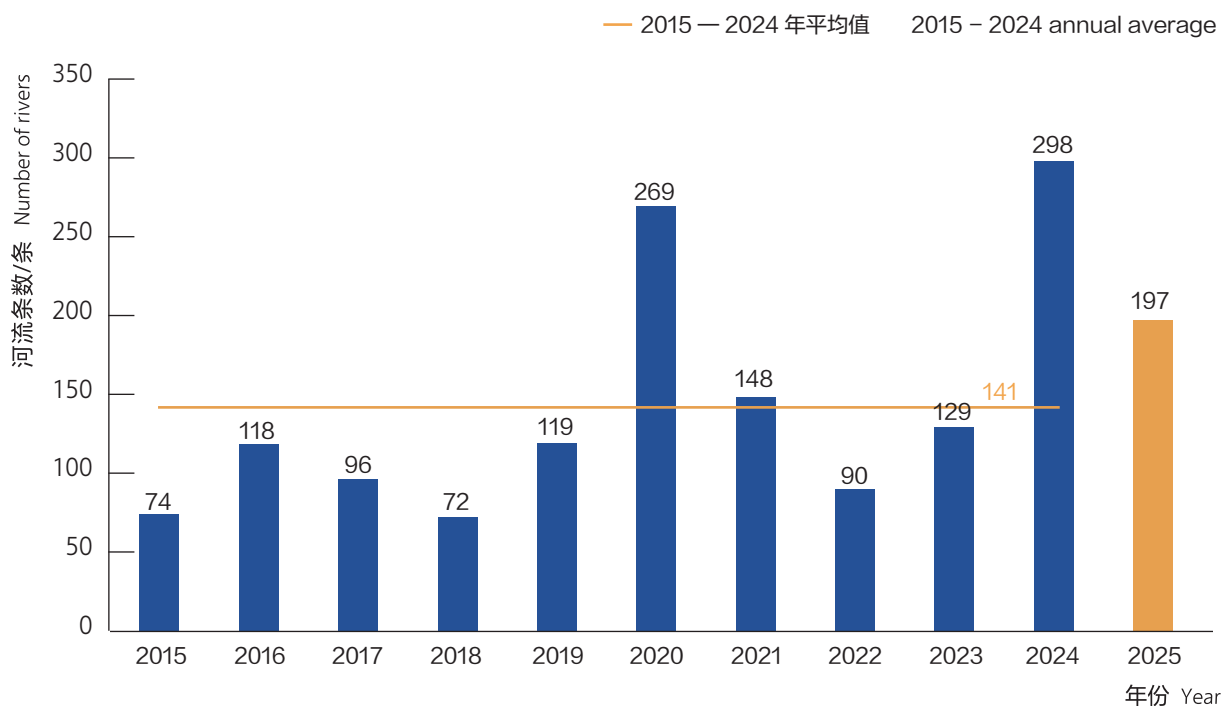


图 2-3 2015—2025 年全国发生超保证洪水河流条数

Figure 2-3 Number of rivers experiencing floods above the guaranteed level/discharge in China, 2015-2025

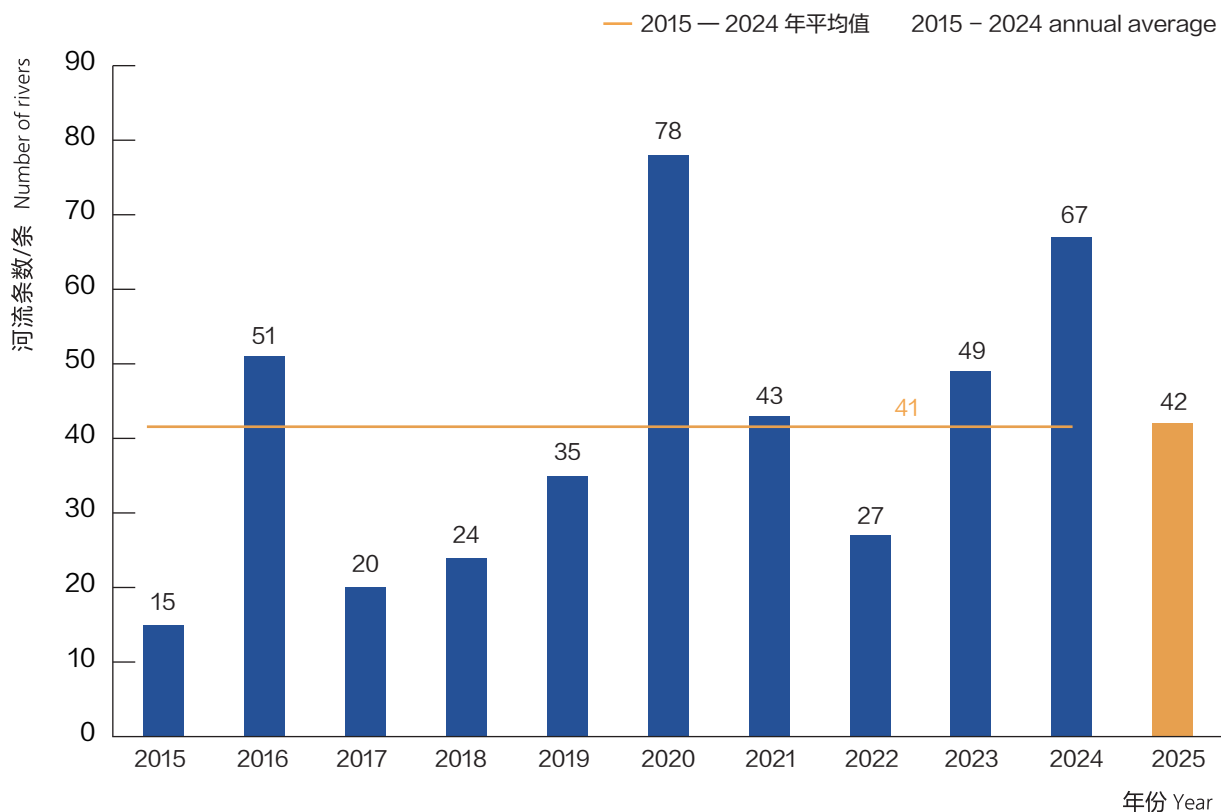


图 2-4 2015—2025 年全国发生超历史实测记录洪水河流条数

Figure 2-4 Number of rivers experiencing floods breaking historical measurements in China, 2015-2025

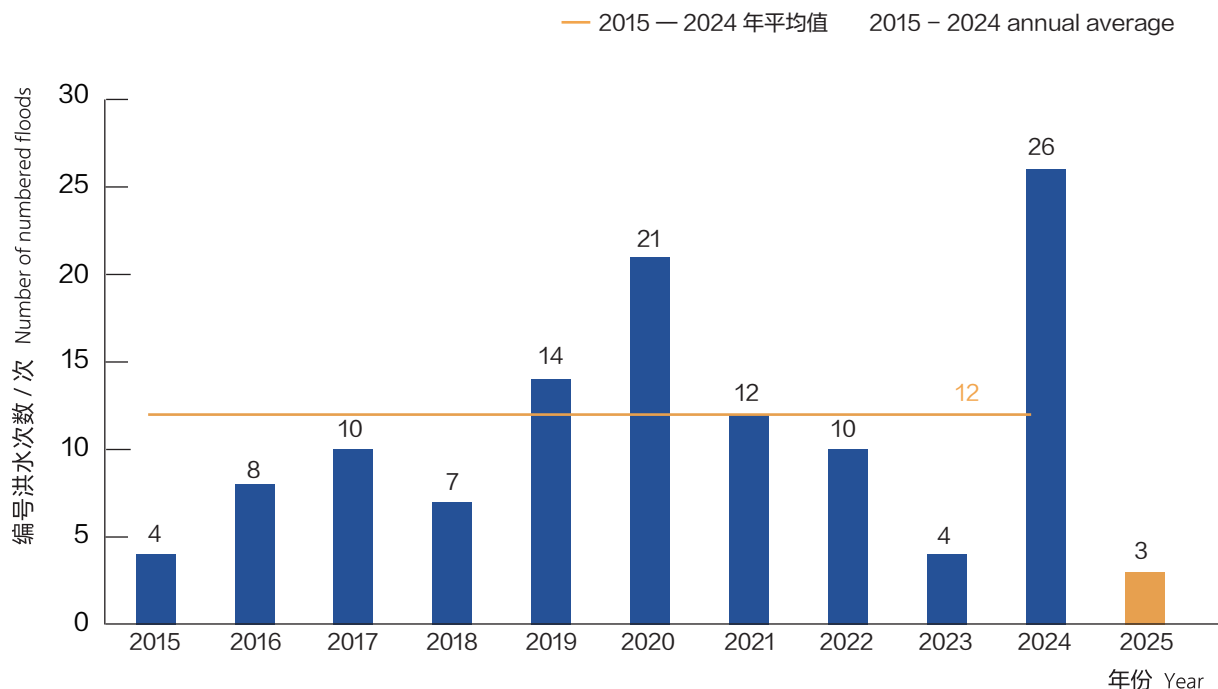


图 2-5 2015—2025 年全国主要江河发生编号洪水次数

Figure 2-5 Statistics of numbered floods in major rivers in China, 2015–2025

全国汛情有三个主要特点。

(1) 海河流域汛情重。海河流域继 2023 年发生流域性特大洪水，2025 年 7 月 23—29 日再次发生区域性大洪水，其中滦河发生 1 次编号洪水，潮白河密云水库发生超历史实测记录入库洪水，滦河、北三河、永定河、大清河 4 大水系 17 条河流发生超警戒以上洪水，12 条河流发生超历史实测记录洪水。

(2) 汉江流域发生密集秋汛。8 月下旬至 10 月中旬，汉江流域发生有实测资料以来最密集秋汛，44 天内发生 7 次编号洪水，汉江干支流 42 条河流发生超警戒以上洪水，汉江上游支流渭水河发生超历史实测记录洪水，丹江口水库第 3 次蓄至正常蓄水位 170.00 米。

(3) 中小河流洪水频发重发。云南、广西、广东、陕西、黑龙江等 30 个省（自治区、直辖市）913 条河流发生超警戒以上洪水，大部分为中小河流，其中 197 条河流发生超保证洪水，42 条河流发生超历史实测记录洪水。贵州都柳江上游发生超 100 年一遇特大洪水；内蒙古黄河支流大黑河流域发生超历史实测记录洪水，洪水历时超过 1 个月。

Floods in 2025 generally took on the following three characteristics.

(1) **Severe flooding in the Haihe River Basin.** Following the basin-wide extreme flood in 2023, the Haihe River Basin experienced another large regional flood from July 23 to 29, 2025. During this period, the Luanhe experienced one numbered flood, the Miyun Reservoir on the Chaobai River received record-breaking volumes of floodwater, while 17 rivers across the four major river systems of the Luanhe, Beisan, Yongding, and Daqing experienced floods above the warning level and 12 rivers experienced record-breaking floods.

(2) **The Hanjiang River Basin experienced a period of frequent autumn floods.** From late August to mid-October, the Hanjiang Basin experienced the most frequent autumn floods since measurements began: 7 numbered floods occurred within 44 days; floods above the warning level occurred on 42 rivers in the mainstream and tributaries of the Hanjiang River; the Xushui that drains to the upper Hanjiang experienced a record-breaking flood, and the Danjiangkou Reservoir was filled to its normal storage level of 170.00 m for the third time.

(3) **Frequent and severe flooding in small and medium-sized rivers.** Floods above the warning level occurred on 913 rivers across 30 provinces/autonomous regions/municipalities, including Yunnan, Guangxi, Guangdong, Shaanxi, and Heilongjiang, with most of these being small and medium-sized rivers. Among them, 197 rivers experienced floods above the guaranteed level, and 42 rivers experienced floods breaking historical measurements. The upper Duli River in Guizhou experienced an extreme flood with an over-100-year return period; the Dahei River, a tributary of the Yellow River in Nei Mongol, experienced a record-breaking flood, with the flood lasting more than one month.

2.2 主要江河洪水过程

2.2.1 汉江最密集秋汛

8月下旬至10月中旬,汉江流域连续发生15次强降雨过程,累计面降雨量550毫米,较常年同期(209毫米)偏多1.6倍,列1961年有实测记录以来第1位,其中流域上游累计面降雨量为634毫米,较常年同期(229毫米)偏多1.8倍。上游干流洋县水文站(陕西汉中市)9月5日21时流量涨至7010立方米每秒,超过警戒流量(7000立方米每秒),形成汉江2025年第1号洪水,6日1时30分洪峰流量9070立方米每秒,超过保证流量(8000立方米每秒);上游干流丹江口水库9月19日12时、9月23日19时、9月29日13时、10月3日23时入库流量分别涨至15000立方米每秒、15300立方米每秒、15600立方米每秒、15000立方米每秒,形成汉江2025年第2号、第3号、第4号、第5号洪水,其中9月23日23时出现2025年最大入库流量19600立方米每秒(汉江2025年第3号洪水洪峰)。上游安康水库10月13日3时入库流量涨至15600立方米每秒,形成汉江2025年第6号洪水。丹江口水库10月18日4时入库流量涨至15000立方米每秒,形成汉江2025年第7号洪水,18日8时水位涨至正常蓄水位170.00米,蓄水量272.1亿立方米,丹江口水库自2013年大坝加高后第3次达到正常蓄水位。



丹江口水库蓄水位达到170.00米(摄于10月26日)
Danjiangkou Reservoir was impounded to 170.00 m (photographed on October 26)

2.2 Major River Flood Processes

2.2.1 The most frequent autumn floods in the Hanjiang River Basin

From late August to mid-October, the Hanjiang River basin experienced 15 consecutive episodes of heavy rainfall, with cumulative area-wide rainfall amounts of 550 mm—1.6 times the normal over the same period (209 mm). This ranked top in post-1961 records. In the upper reaches of the basin, the cumulative area-wide rainfall reached 634 mm, 1.8 times the normal over the same period (229 mm). At 21:00 on September 5, the inflow to the Yangxian hydrological station (Hanzhong City, Shaanxi) on the upper mainstream rose to 7,010 m³/s (warning-level flow threshold being 7,000 m³/s), marking the first numbered flood of 2025 on the Hanjiang. At 1:30 on September 6, the peak flow reached 9,070 m³/s, exceeding the guaranteed-level flow threshold (8,000 m³/s); the inflow to the Danjiangkou Reservoir on the upper mainstream rose to 15,000 m³/s at 12:00 on September 19, 15,300 m³/s at 19:00 on September 23, 15,600 m³/s at 13:00 on September 29, and 15,000 m³/s at 23:00 on October 3, triggering the 2025 No. 2, No. 3, No. 4, and No. 5 floods on the Hanjiang, respectively. Among these, the highest reservoir inflow of 19,600 m³/s (the flood peak of Hanjiang 2025 No. 3 flood) occurred at 23:00 on September 23. At 3:00 on October 13, the inflow to the upstream Ankang Reservoir rose to 15,600 m³/s, forming the 2025 No. 6 flood on the Hanjiang. At 4:00 on October 18, the inflow to the Danjiangkou Reservoir rose to 15,000 m³/s, forming the 2025 No. 7 flood on the Hanjiang. By 8:00 on the 18th, the water level had risen to the normal storage level of 170.00 m, with a storage volume of 27.21 billion m³. This marked the third time the Danjiangkou Reservoir had reached its normal storage level since the dam was heightened in 2013.



2.2.2 黄河第 1 号洪水

10 月 1—13 日,黄河流域发生 4 次强降雨过程,雨区主要集中在中游和下游,累计面降雨量 131 毫米,较常年同期(18 毫米)偏多 6.2 倍,其中黄河干流中游头道拐至花园口、渭河、沁河、黄河干流下游花园口以下、大汶河累计面降雨量分别为 113 毫米、118 毫米、130 毫米、201 毫米、167 毫米,较常年同期(16 毫米、23 毫米、19 毫米、14 毫米、20 毫米)偏多 5.9 倍、4.1 倍、5.8 倍、13 倍、7.2 倍,均位列 1961 年有实测记录以来第 1 位。黄河中游支流渭河临潼水文站(陕西西安市)10 月 12 日 13 时流量涨至 3020 立方米每秒,超过警戒流量(3000 立方米每秒),形成渭河 2025 年第 1 号洪水;13 日 5 时 36 分洪峰流量 4910 立方米每秒,相应水位 357.38 米。黄河中游干流潼关水文站(陕西渭南市)10 月 12 日 23 时流量涨至 5010 立方米每秒,超过警戒流量(5000 立方米每秒),形成黄河 2025 年第 1 号洪水;14 日 2 时 30 分洪峰流量 5510 立方米每秒,15 日 16 时流量退至 4980 立方米每秒,超警历时 4 天。



三门峡水利枢纽有序下泄洪水(摄于 10 月 15 日)

The Sanmenxia Water Conservancy Complex was conducting planned floodwater discharge (photographed on October 15)

2.2.2 The Yellow River No. 1 Flood

From October 1 to 13, the Yellow River Basin experienced four episodes of heavy rainfall, primarily concentrated in the middle and lower reaches. The cumulative area-wide rainfall totaled 131 mm, 6.2 times the normal over the same period (18 mm). Specifically, the middle reaches of the Yellow River mainstream from Toudaoguai to Huayuankou, the Weihe River, the Qinhe River, the lower reaches of the Yellow River mainstream downstream of Huayuankou, and the Dawen River recorded cumulative rainfall of 113 mm, 118 mm, 130 mm, 201 mm, and 167 mm, respectively, which were 5.9 times, 4.1 times, 5.8 times, 13 times, 7.2 times their respective normals over the same period (16 mm, 23 mm, 19 mm, 14 mm, and 20 mm) and all topping the post-1961 records. At Lintong hydrological station on the Weihe (a tributary of the middle Yellow River in Xi'an, Shaanxi), the inflow rose to 3,020 m³/s at 13:00 on October 12, exceeding the warning-level flow threshold (3,000 m³/s) and marking the 2025 No. 1 flood on the Weihe; At 5:36 on the 13th, the flood peak flow reached 4,910 m³/s, with a corresponding water level of 357.38 m. At Tongguan hydrological station on the mainstream of the middle Yellow River (Weinan City, Shaanxi), the inflow rose to 5,010 m³/s at 23:00 on October 12, exceeding the warning-level flow threshold (5,000 m³/s) and marking the 2025 No. 1 flood on the Yellow River; At 2:30 on the 14th, the flood peak flow reached 5,510 m³/s, and by 16:00 on the 15th, the flow had dropped to 4,980 m³/s, with the flow remaining above the warning level for four days.

2.2.3 海河“25·7”区域性大洪水

7月23—29日，海河流域发生特强降雨过程，流域累计面降雨量87毫米，其中北三河、滦河及冀东沿海、永定河、大清河累计面降雨量分别为189毫米、122毫米、119毫米、109毫米。受强降雨影响，滦河、北三河、永定河、大清河4大水系17条河流发生超警戒以上洪水，滦河及支流蚂蚁吐河、潮白河及支流潮河、蓟运河支流洵河、永定河支流饮马河、大清河支流漕河等12条河流发生超历史实测记录洪水，潮白河密云水库发生超历史实测记录入库洪水，海河流域发生区域性大洪水。滦河中游干流潘家口水库7月28日4时30分入库流量涨至2270立方米每秒，形成滦河2025年第1号洪水，17时最大入库流量4260立方米每秒，列1980年有实测记录以来第2位（第1位为1994年9870立方米每秒），30日11时出现此次洪水过程最高库水位223.79米（正常蓄水位222.00米）。潮白河上游干流密云水库7月27日3时第1次入库洪峰流量6550立方米每秒，为1959年建库以来最大（历史最大入库流量3670立方米每秒，1994年7月），相应出库流量81.3立方米每秒，28日8时第2次入库洪峰流量4550立方米每秒，相应出库流量501立方米每秒；29日23时出现最高库水位155.59米，为建库以来最高水位（历史最高水位155.32米，2021年10月），相应蓄水量36.4亿立方米。



密云水库泄洪（摄于7月29日）

The Miyun Reservoir was discharging floodwaters (photographed on July 29)

2.2.3 The “July 2025” large flood on the Haihe River

From July 23 to 29, the Haihe River Basin experienced an extremely heavy rainfall process, with cumulative area-wide rainfall of 87 mm across the basin. Cumulative area-wide rainfall in the Beisan (northern three) rivers, Luanhe and eastern Hebei coastal areas, the Yongding River, and Daqing River were 189 mm, 122 mm, 119 mm, and 109 mm, respectively. Due to the heavy rainfall, 17 rivers across the four major river systems—the Luanhe River, Beisan rivers, Yongding River, and Daqing River—experienced floods above warning levels. Twelve rivers—including Luanhe and its tributary Yimatu, Chaobai and its tributary Chaohe, Jiyun River’s tributary Juhe; the Yongding River’s tributary Yinma, and Daqing River’s tributary Caohe—experienced floods breaking historical measurements. The Miyun Reservoir on the Chaobai River also recorded unprecedented inflow levels. As a result, the Haihe River Basin experienced a regional large flood. At 4:30 on July 28, the inflow to the Panjiakou Reservoir on the middle Luanhe rose to 2,270 m³/s, marking the 2025 No. 1 flood on the Luanhe. The peak flow of 4,260 m³/s was recorded at 17:00 and became the second-highest recorded since 1980 (the highest being 9,870 m³/s in 1994). At 11:00 on the 30th, the reservoir reached its highest water level of 223.79 m during this flood process (normal storage level being 222.00 m). At Miyun Reservoir on the upper Chaobai River, the first peak inflow of 6,550 m³/s occurred at 3:00 on July 27, surpassing the previous maximum flow record of 3,670 m³/s in July 1994, with a corresponding outflow of 81.3 m³/s. At 8:00 on the 28th, the second peak inflow reached 4,550 m³/s, with a corresponding outflow of 501 m³/s; at 23:00 on the 29th, the reservoir reached its highest water level of 155.59 m, surpassing the previous maximum record of 155.32 m (October, 2021), with a corresponding storage volume of 3.64 billion m³.

2.2.4 郁江 2 次连续超警洪水

9月21日至10月9日,受台风“桦加沙”“博罗依”“麦德姆”接连影响,郁江流域发生5次强降雨过程,累计面降雨量290毫米,较常年同期(50毫米)偏多4.8倍,列1961年有实测记录以来第1位,其中左江、右江流域累计面降雨量分别为346毫米、291毫米,较常年同期(57毫米、46毫米)偏多5倍、5.3倍。右江干流百色水库(广西百色市)9月30日19时最大入库流量8600立方米每秒,为2005年建库以来最大入库流量(历史最大入库流量4800立方米每秒,2008年),10月1日7时最大出库流量2970立方米每秒。郁江干流南宁水文站10月1日17时40分水位涨至警戒水位(73.00米),形成郁江2025年第1号洪水,4日3时30分洪峰水位76.35米,超过警戒水位3.35米,6日14时水位退至警戒水位以下。7日15时10分郁江南宁站水位再次涨至警戒水位(73.00米),形成郁江2025年第2号洪水,9日22时10分洪峰水位75.90米,超过警戒水位2.90米,12日10时水位退至警戒水位以下。



郁江南宁城区段水位持续上涨(摄于10月3日)

Water levels kept rising along the Nanning urban section on the Yujiang River
(photographed on October 3)

2.2.4 Two consecutive floods above the warning level on the Yujiang River

From September 21 to October 9, affected by the successive impacts of typhoons Ragasa, Bualoi, and Matmo, the Yujiang River basin experienced five episodes of heavy rainfall, with cumulative area-wide rainfall of 290 mm—4.8 times the normal over the same period (50 mm) and ranking first in post-1961 measured records. Cumulative area-wide rainfall in the Zuojiang and Youjiang river basins reached 346 mm and 291 mm, respectively, which were 5 times and 5.3 times their respective normals over the same period (57 mm and 46 mm). At Baise Reservoir (Baise City, Guangxi) on the Youjiang mainstream, the maximum inflow reached 8,600 m³/s at 19:00 on September 30, marking the highest inflow since the reservoir was constructed in 2005 (the historical maximum inflow was 4,800 m³/s in 2008). The maximum outflow reached 2,970 m³/s at 7:00 on October 1. At 17:40 on October 1, the water level at Nanning hydrological station on the Yujiang mainstream rose to the warning level of 73.00 m, marking the 2025 No. 1 flood on the Yujiang. At 3:30 on the 4th, the flood peak reached 76.35 m, exceeding the warning level by 3.35 m; by 14:00 on the 6th, the water had receded below the warning level. At 15:10 on the 7th, the water level at Nanning station on the Yujiang rose again to the warning level of 73.00 m, marking the 2025 No. 2 flood on the Yujiang. At 22:10 on the 9th, the peak water level reached 75.90 m, exceeding the warning level by 2.90 m; by 10:00 on the 12th, the water had receded below the warning level.

2.2.5 太湖第1号洪水

7月28日至8月2日，太湖流域发生强降雨过程，累计面降雨量197毫米，较常年同期（27毫米）偏多6.2倍，列1961年有实测记录以来第1位，其中武澄锡虞区、浦西区累计面降雨量303毫米、350毫米。太湖平均水位8月2日4时25分涨至警戒水位（3.80米），形成太湖2025年第1号洪水，3日14时10分洪峰水位3.90米，超过警戒水位0.10米，7日4时35分水位退至警戒水位以下，超警历时6天。



太湖水位上涨达警戒水位（摄于8月2日）

Taihu Lake rose to the warning level (photographed on August 2)

2.2.5 Taihu Lake No. 1 Flood

From July 28 to August 2, the Taihu Lake basin experienced a heavy rainfall process, with cumulative area-wide rainfall of 197 mm—6.2 times the normal over the same period (27 mm) and topping the post-1961 measured records. Within the basin, the Wuchengxiyu and Puxi districts recorded cumulative area-wide rainfall of 303 mm and 350 mm, respectively. The average water level of Taihu Lake rose to the warning level (3.80 m) at 4:25 on August 2, marking the Taihu No. 1 flood in 2025. The flood peak reached 3.90 m at 14:10 on the 3th, exceeding the warning level by 0.10 m. By 4:35 on the 7th, the water level had dropped below the warning level, with the flood remaining above the warning level for six days.



2.3 旱情及特点

2025 年，我国先后发生西南地区春旱、北方冬麦区等地春夏旱、黄淮江淮夏伏旱等干旱过程，汉江流域出现极端枯水。旱情主要有三个特点。

(1) 干旱涉及范围广。长江、黄河、淮河、海河、珠江、松辽流域 22 个省（自治区、直辖市）发生干旱。西北、华北等地春夏阶段性旱情严重，西南和长江中下游夏秋出现持续枯水，吉林、新疆等地局地短时受旱。

(2) 部分地区受旱时间长。长江中下游地区 2024 年 8 月起降雨、来水持续偏少，冬春季江河湖泊水位偏低，汉江流域枯水从 2025 年 3 月一直延续至 8 月，湖北等地水工程长时间处于抗旱应急调度状态。广西等西南地区冬春旱情从 2024 年底持续至 2025 年 5 月，部分山区长期拉送水保障居民饮用水安全。河南、陕西等地反复受旱，4 月出现春旱，7 月初短暂缓解后又发生夏伏旱，直至秋季 9 月旱情才完全解除。

(3) 长江黄河淮河流域水文干旱突出。长江干流宜昌站 5—8 月平均流量较常年同期偏少 3 成，中下游干流主要控制站水位较常年同期最大偏低 5 米以上；春夏季部分时段汉江、嘉陵江、乌江来水量及洞庭湖“四水”（湘江、资水、沅江、澧水）、鄱阳湖“五河”（赣江、抚河、信江、饶河、修河）合成流量较常年同期偏少 2 ~ 7 成。黄河 4—8 月主要来水区间来水量较常年同期偏少 2 ~ 5 成。淮河流域主汛期干流及主要支流来水量较常年同期偏少 7 ~ 9 成，干流正阳关河段和洪泽湖、南四湖下级湖水位低于旱警水位，南四湖下级湖水位两次降至死水位以下。相关地区调度水工程全力补水调水，水文干旱未对城乡供水安全造成严重影响。

2.3 Droughts and Main Characteristics

In 2025, China experienced a series of drought events, including spring drought in the southwest, spring and summer drought in the northern winter wheat-growing regions, and mid-summer drought in the Huang-Huai and Jiang-Huai regions, with the Hanjiang River basin experiencing extreme low water levels. The drought conditions had three main characteristics.

(1) Droughts impacted a wide area. Drought conditions occurred in 22 provinces/autonomous regions/municipalities within the Yangtze River, Yellow River, Huaihe River, Haihe River, Pearl River, and Songhua-Liaohe river basins. Severe seasonal droughts affected the Northwest and North China during spring and summer, while persistent low water levels occurred in the Southwest and the middle and lower reaches of the Yangtze River

during summer and autumn. Areas such as Jilin and Xinjiang experienced localized, short-term drought conditions.

(2) *Prolonged drought duration in some regions.* From August 2024 onward, rainfall and inflow in the middle and lower reaches of the Yangtze River remained persistently less than normal, leading to low water levels in rivers and lakes during the winter and spring. The low water conditions in the Hanjiang River basin persisted from March 2025 through August, with water conservancy projects in Hubei and other areas operating under emergency drought-relief mode for extended periods. In southwestern regions such as Guangxi, winter and spring drought conditions persisted from late 2024 through May 2025, with some hilly areas replying on water tankers from outside to meet drinking water demands for long periods. Regions such as Henan and Shaanxi experienced recurring drought conditions: a spring drought occurred in April, which briefly eased in early July before a mid-summer drought set in, lasting until the autumn September.

(3) *Hydrological droughts were particularly severe in the Yangtze, Yellow River, and Huaihe river basins.* From May to August, the average flow at the Yichang station on the Yangtze mainstream was 30% lower than normal over the same period, and water levels at major control stations on the middle and lower reaches were up to 5 m lower than their normals. During certain periods in spring and summer, inflows to the Hanjiang, Jialing, and Wujiang, as well as the composite flow of “Four Rivers” of Dongting Lake (Xiangjiang, Zishui, Yuanjiang, and Lishui) and “Five Rivers” of Poyang Lake (Ganjiang, Fuhe, Xinjiang, Raohe, and Xiuhe) were 20%-70% lower than their respective normals over the same period. Inflows to the Yellow River from the main inflow zones were 20%-50% less than their respective normals during April to August. During the main flood season in the Huaihe River basin, inflows to the mainstream and major tributaries were 70%-90% less than their respective normals over the same period; water levels in the Zhengyangguan section of the mainstream, as well as in Hongze Lake and the lower Nansi Lakes, fell below the drought warning level; water levels in the lower Nansi Lakes dropped below the dead storage level twice. The relevant regions made every effort to divert and replenish water through water projects, preventing the hydrological drought from seriously disrupting urban and rural water supplies.



2.4 主要干旱过程

2.4.1 西南地区春旱

1—4月，广西、云南大部 and 四川东北部南部累计面降雨量较常年同期偏少2~5成，其中广西为1961年有完整记录以来同期最少；广西柳江桂江郁江、云南元江南盘江、四川雅砻江等江河来水量较常年同期偏少3~8成；4月下旬广西桂林贺州、云南昆明红河、四川攀枝花广安等地中小水库蓄水量较常年同期偏少3~5成。广西、云南、四川发生冬春旱，5月中旬3省（自治区）一度有48.67千公顷耕地受旱，17万人、9万头大牲畜因旱临时饮水困难。5月下旬旱区陆续出现降雨，广西、云南旱情解除，四川旱情至6月底逐步解除。

2.4 Major Drought Processes

2.4.1 Spring Drought in Southwest China

From January to April, cumulative area-wide precipitation in Guangxi, most of Yunnan, and northeastern and southern Sichuan were 20%-50% less than their respective normals over the same period; in particular, Guangxi received the lowest ever precipitation since complete records began in 1961. Inflow of rivers such as the Liujiang, Guijiang, and Yujiang in Guangxi, the Yuanjiang and Nanpan in Yunnan, and the Yalong River in Sichuan were 30%-80% less than their respective normals over the same period. By late April, the small and medium-sized reservoirs in areas such as Guilin and Hezhou in Guangxi, Kunming and Honghe in Yunnan, and Panzhihua and Guang'an in Sichuan fell short of their normal impoundment by 30%-50%. Winter and spring droughts occurred in Guangxi, Yunnan, and Sichuan. By mid-May, 48,670 ha of cropland across the three provinces/autonomous region were affected by drought, and 170,000 people and 90,000 large livestock faced temporary drinking water shortages due to the drought. Rainfall began to occur in the drought-stricken areas in late May, lifting drought conditions in Guangxi and Yunnan, while Sichuan remained under drought effect until the end of June.

2.4.2 北方冬麦区等地春夏连旱

4月至6月中旬，西北、华北南部和内蒙古中东部累计面降雨量较常年同期偏少2~4成，河北中部南部、山西中部南部、内蒙古中西部、河南北部西部、陕西中部南部、甘肃大部偏少5~8成，陕西渭河北洛河、甘肃洮河来水量较常年同期偏少2~8成；6月上旬陕西西安延安咸阳商洛安康、甘肃张掖等地中小水库蓄水量较常年同期偏少2~7成。持续少雨叠加罕见高温，造成土壤失墒加剧，旱情迅速蔓延，5月下旬高峰期，河北、山西、内蒙古、河南、陕西、甘肃、宁夏7省（自治区）1672.75千公顷耕地受旱，主要影响冬小麦生长，2万人、10万头大牲畜因旱临时饮水困难。6月下旬旱区陆续出现降雨，旱情逐步解除。

2.4.2 Spring-summer drought in northern winter wheat-growing regions

From April to mid-June, cumulative area-wide rainfall across the Northwest, southern North China, and central and eastern Nei Mongol were 20%-40% less than their respective normals over the same period. In central and southern Hebei, central and southern Shanxi, central and western Nei Mongol, northern and western Henan, central and southern Shaanxi, and most of Gansu, rainfall were 50%-80% short of their normals. Inflows to the Weihe and Beiluo rivers in Shaanxi and the Taohe River in Gansu were 20%-80% short of their normals. In early June, the small and medium-sized reservoirs in Xi'an, Yan'an, Xianyang, Shangluo, and Ankang in Shaanxi, as well as Zhangye in Gansu fell short of their normal impoundment by 20%-70%. Persistent dryness combined with unusual heat led to accelerated soil moisture loss and the rapid spread of drought conditions. The drought reached its peak in late May, when 1,672,750 ha of farmland across seven provinces/autonomous regions—Hebei, Shanxi, Nei Mongol, Henan, Shaanxi, Gansu, and Ningxia—were affected by drought, which primarily hurt the growth of winter wheat. The drought caused temporary drinking water shortages for 20,000 people and 100,000 large livestock. Rainfall began to occur in the drought-stricken areas in late June, and the drought conditions gradually subsided.

2.4.3 黄淮、江淮夏伏旱

7—8月，黄淮、江淮等地累计面降雨量较常年同期偏少2~4成，其中安徽大部、山东中部南部、河南东部、湖北东部、陕西南部偏少5成以上。淮河流域7月无有效降雨日数达23天，面降雨量较常年同期偏少7成，均为1954年有实测记录以来同期最少；安徽淮河干流及沙颍河、山东沂河、河南贾鲁河、湖北汉江、陕西渭河北洛河来水量较常年同期偏少3~9成。河南、陕西等地受旱区域与春夏旱重叠，前期抗旱用水量大，部分水库蓄水消耗较多、水位低于旱警水位，河南平原区平均地下水位较2024年同期下降近4米，部分机电井出水量减少，甚至无法出水。8月上旬，安徽、山东、河南、湖北、陕西等5省一度有1378.21千公顷耕地受旱，主要影响玉米、水稻等秋粮作物生长。9月起旱区出现多次降雨过程，旱情逐步解除。

2.4.3 Mid-summer drought in the Huang-Huai and Jiang-Huai regions

From July to August, cumulative area-wide rainfall across the Huang-Huai and Jiang-Huai regions were 20%-40% short of their normals. Rainfall was at least 50% less compared to normal in most of Anhui, central and southern Shandong, eastern Henan, eastern Hubei, and southern Shaanxi. In the Huaihe River Basin, there were 23 days without effective rainfall in July, and area-wide rainfall amounts were 70% less than normal—both the lowest on record since 1954 when measurements began. Inflows to the Huaihe mainstream and the Shaying tributary in Anhui, the Yihe River in Shandong, the Jialu River in Henan, the Hanjiang River in Hubei, and the Beiluo and Weihe rivers in Shaanxi were 30%-90% less than their respective normals over the same period. In areas such as Henan and Shaanxi, the ongoing drought overlaps with the spring and summer droughts. Huge amounts of water was consumed in the earlier drought relief period, resulting in certain reservoirs being drawn down below the drought warning levels. The average water table in Henan's plain areas dropped by nearly 4 m compared to the same period in 2024, and some electromechanical wells had seen reduced water output or even stopped producing water. In early August, a total of 1,378,210 ha of farmland in five provinces including Anhui, Shandong, Henan, Hubei, and Shaanxi were affected by drought, which primarily impacted the growth of autumn crops such as corn and rice. Starting in September, multiple rainfall events occurred in the drought-stricken areas, and drought conditions gradually subsided.

2.4.4 汉江流域极端枯水

汉江上游1月至8月中旬累计面降雨量较常年同期偏少2成，其中4—7月偏少3成，为1961年有实测记录以来最少。丹江口水库1月至8月中旬天然入库径流量84.9亿立方米，较常年同期偏少5成，其中4月至8月中旬61.2亿立方米，为1969年建库以来最少；5月库水位一度降至死水位150.00米以下，通过采取应急调度措施，5月30日回涨至150.00米以上并长时间低水位运行，至8月24日仅抬升至152.00米。4—8月汉江中下游干流主要控制站水位较常年同期最大偏低4.89～5.52米。持续枯水威胁南水北调中线受水区、水源区和汉江中下游等区域城乡供水、灌溉、航运、生态等，陕西、湖北、河南3省出现旱情。8月下旬开始华西秋雨，汉江流域枯水形势解除。

2.4.4 Extreme low water levels in the Hanjiang River Basin

Cumulative area-wide precipitation over the upper Hanjiang River Basin from January to mid-August was 20% less than normal over the same period, with a 30% deficit from April to July—the lowest level since records began in 1961. From January to mid-August, natural inflow to the Danjiangkou Reservoir totaled 8.49 billion m³, 50% less than normal. In particular, inflow from April to mid-August was 6.12 billion m³, the lowest since the reservoir's construction in 1969; In May, the reservoir even temporarily dropped below the dead storage level of 150.00 m. Through emergency scheduling measures, the water level was raised above 150.00 m on May 30 and remained low for an extended period; by August 24, it had risen only to 152.00 m. From April to August, water levels at major control stations along the middle and lower reaches of the Hanjiang River were up to 4.89 to 5.52 m lower than normal over the same period. The prolonged low waters threatened urban and rural water supply and irrigation, navigation, and ecosystem health in the water recipient areas, water source areas of the Middle Route of the South-to-North Water Diversion Project and the middle and lower reaches of the Hanjiang River. Drought conditions occurred in Shaanxi, Hubei, and Henan provinces. With the onset of the autumn rains in western China in late August, the low water crisis in the Hanjiang River basin was lifted.

湖北十堰丹江口水库枯水期蓄水情况
(摄于5月30日)
Water storage conditions at the
Danjiangkou Reservoir in Shiyan,
Hubei, during the low-water period
(photographed on May 30)





3

水旱灾害

FLOOD AND DROUGHT DISASTERS

3.1 洪涝灾情

3.1.1 总体灾情

2025 年，洪涝导致全国 2769.52 万人次受灾，较近 10 年平均值偏少 54.9%；400 人死亡失踪，较近 10 年平均值偏少 7.2%；2.70 万间房屋倒塌，较近 10 年平均值偏少 80.2%；农作物受灾 2594.08 千公顷，较近 10 年平均值偏少 56.7%，其中绝收 383.34 千公顷；直接经济损失 1646.61 亿元，较近 10 年平均值偏少 26.6%；直接经济损失占当年 GDP 的 0.12%，较近 10 年平均值偏少 48.3%。河北、北京、内蒙古、贵州、云南、湖南 6 省（自治区、直辖市）直接经济损失均超过 100 亿元，占全国总损失的 69.2%。

3.1 Flood Disasters

3.1.1 Losses and damages

In 2025, floods affected 27.6952 million person-times nationwide, 54.9% less than the preceding decadal average; 400 people were reported dead or missing, 7.2% less than the preceding decadal average; 27,000 dwellings collapsed, 80.2% less than the preceding decadal average; 2,594,080 ha of cropland were affected, 56.7% less than the preceding decadal average; among the affected cropland, 383,340 ha suffered total crop failure; direct economic losses amounted to 164.661 billion RMB (26.6% less than the preceding decadal average) and accounted for 0.12% of the annual GDP (48.3% lower than the preceding decadal average). Six provinces/autonomous regions/municipalities—Hebei, Beijing, Nei Mongol, Guizhou, Yunnan, and Hunan—each suffered direct economic losses exceeding 10 billion RMB and collectively claimed 69.2% of the national total loss.

表 3-1 2025 年全国因洪涝受灾人口、死亡失踪人口及直接经济损失情况
Table 3-1 Population affected, deaths and missing persons, direct economic losses by floods nationwide in 2025

地区 Region	受灾人口 / 万人次 Affected population/ 10,000 person-times	死亡失踪人口 / 人 Deaths and missing persons/ person	直接经济损失 / 亿元 Direct economic losses / 100 million RMB	地区 Region	受灾人口 / 万人次 Affected population/ 10,000 person-times	死亡失踪人口 / 人 Deaths and missing persons/ person	直接经济损失 / 亿元 Direct economic losses / 100 million RMB
全国 Nationwide	2769.52	400	1646.61	河南 Henan	246.00	12	28.90
北京 Beijing	30.08	84	173.95	湖北 Hubei	148.60	2	53.22
天津 Tianjin	1.64	5	10.22	湖南 Hunan	267.12	6	100.78
河北 Hebei	131.61	69	467.24	广东 Guangdong	114.28	6	83.09
山西 Shanxi	43.30	17	20.89	广西 Guangxi	67.66	15	13.50
内蒙古 Nei Mongol	142.35	38	162.28	海南 Hainan	8.81		2.50
辽宁 Liaoning	18.95	2	14.70	重庆 Chongqing	73.43	1	16.03
吉林 Jilin	7.35	4	8.20	四川 Sichuan	494.01		79.40
黑龙江 Heilongjiang	0.64		0.40	贵州 Guizhou	238.66	17	132.14
上海 Shanghai				云南 Yunnan	334.58	7	103.10
江苏 Jiangsu	0.06		0.01	西藏 Xizang	3.70	16	1.32
浙江 Zhejiang	0.60		2.71	陕西 Shaanxi	165.31	3	79.93
安徽 Anhui	76.34		4.77	甘肃 Gansu	67.52	64	52.11
福建 Fujian	15.54	3	16.44	青海 Qinghai	11.55	8	3.13
江西 Jiangxi	15.18		1.73	宁夏 Ningxia	3.84	2	1.02
山东 Shandong	39.64	16	11.94	新疆 Xinjiang	1.17	3	0.96

注 数据来源于应急管理部，不包括台风引发暴雨洪涝导致的直接经济损失。空白表示无灾情上报。新疆数据包括新疆生产建设兵团。
Note The data is from the Ministry of Emergency Management and does not include direct economic losses caused by typhoon-induced rainstorms and floods. Blanks indicate no such disaster reports. The data for Xinjiang includes that from the Xinjiang Production and Construction Corps.

表 3-2 2025 年全国因洪涝农作物受灾面积、农作物绝收面积、倒塌房屋情况
Table 3-2 Cropland affected and failed, and collapsed dwellings by floods
nationwide in 2025

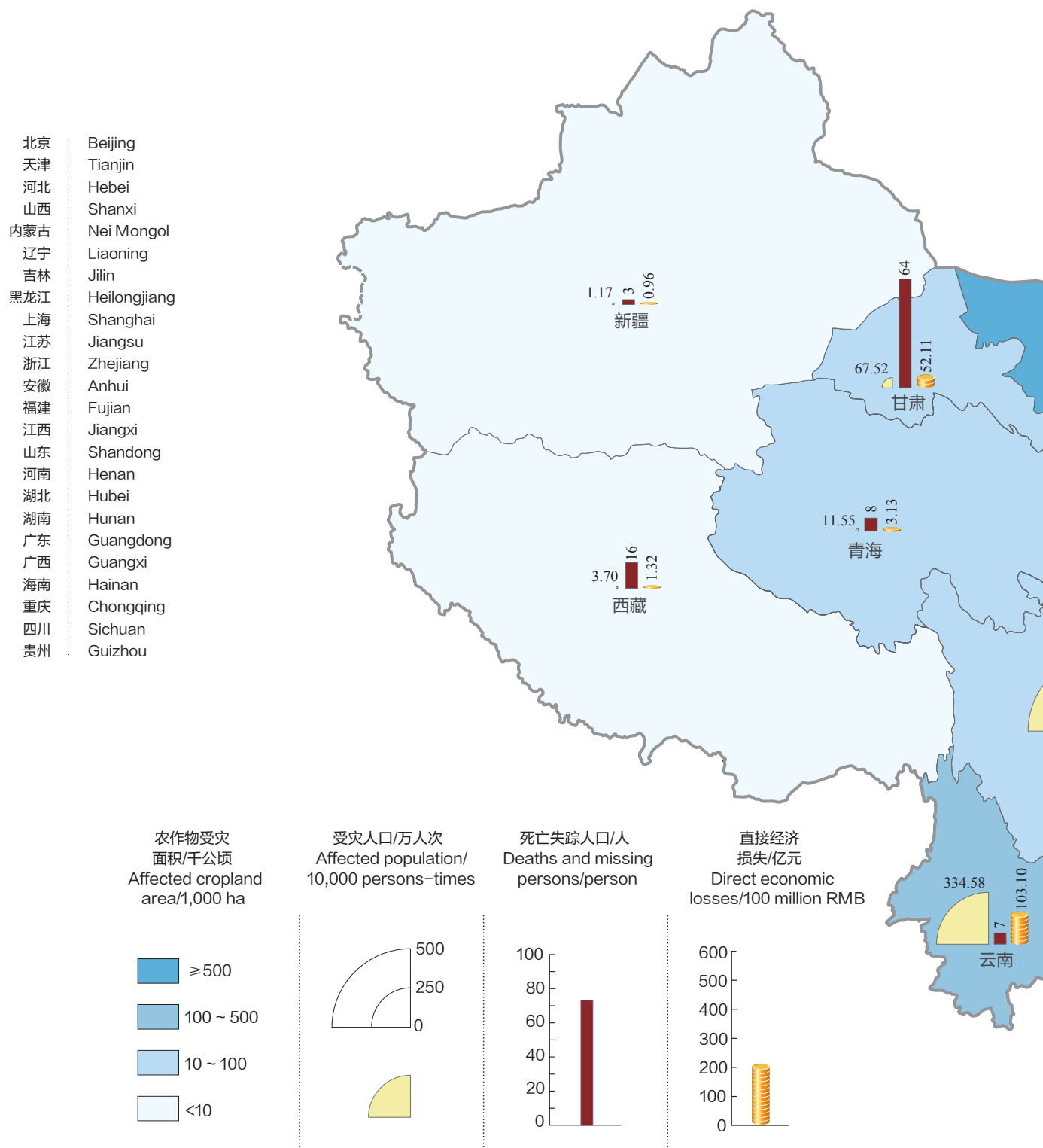
地区 Region	农作物受灾 面积 / 千公顷 Affected cropland area / 1,000 ha	农作物绝收 面积 / 千公顷 Failed cropland area / 1,000 ha	倒塌房屋 / 万间 Collapsed dwellings/ 10,000 rooms	地区 Region	农作物受灾 面积 / 千公顷 Affected cropland area / 1,000 ha	农作物绝收 面积 / 千公顷 Failed cropland area / 1,000 ha	倒塌房屋 / 万间 Collapsed dwellings/ 10,000 rooms
全国 Nationwide	2594.08	383.34	2.70	河南 Henan	209.18	0.95	0.01
北京 Beijing	13.72	3.47	0.25	湖北 Hubei	106.85	9.90	0.03
天津 Tianjin	1.39	0.45		湖南 Hunan	214.51	21.74	0.08
河北 Hebei	237.52	66.93	0.51	广东 Guangdong	38.96	2.19	0.05
山西 Shanxi	82.27	7.58	0.10	广西 Guangxi	23.51	1.16	0.06
内蒙古 Nei Mongol	864.84	172.93	0.79	海南 Hainan	1.36	0.37	
辽宁 Liaoning	24.74	1.17	0.01	重庆 Chongqing	32.83	4.67	0.02
吉林 Jilin	8.33	1.34	0.01	四川 Sichuan	77.94	5.91	0.16
黑龙江 Heilongjiang	13.18	1.16		贵州 Guizhou	86.49	8.41	0.10
上海 Shanghai				云南 Yunnan	163.55	25.81	0.09
江苏 Jiangsu	0.05			西藏 Xizang	1.29	0.21	0.02
浙江 Zhejiang	3.06	0.39	0.01	陕西 Shaanxi	162.18	38.21	0.13
安徽 Anhui	105.33	1.78		甘肃 Gansu	29.80	2.64	0.17
福建 Fujian	11.56	0.41	0.05	青海 Qinghai	11.13	0.56	
江西 Jiangxi	13.53	0.34		宁夏 Ningxia	10.08	1.05	
山东 Shandong	41.83	0.63	0.05	新疆 Xinjiang	3.07	0.98	

注 数据来源于应急管理部，不包括台风引发暴雨洪涝导致的受灾情况。空白表示无灾情上报。新疆数据包括新疆生产建设兵团。

Note The data is from the Ministry of Emergency Management and does not include losses caused by typhoon-induced rainstorms and floods. Blanks indicate no such disaster reports. The data for Xinjiang includes that from the Xinjiang Production and Construction Corps.

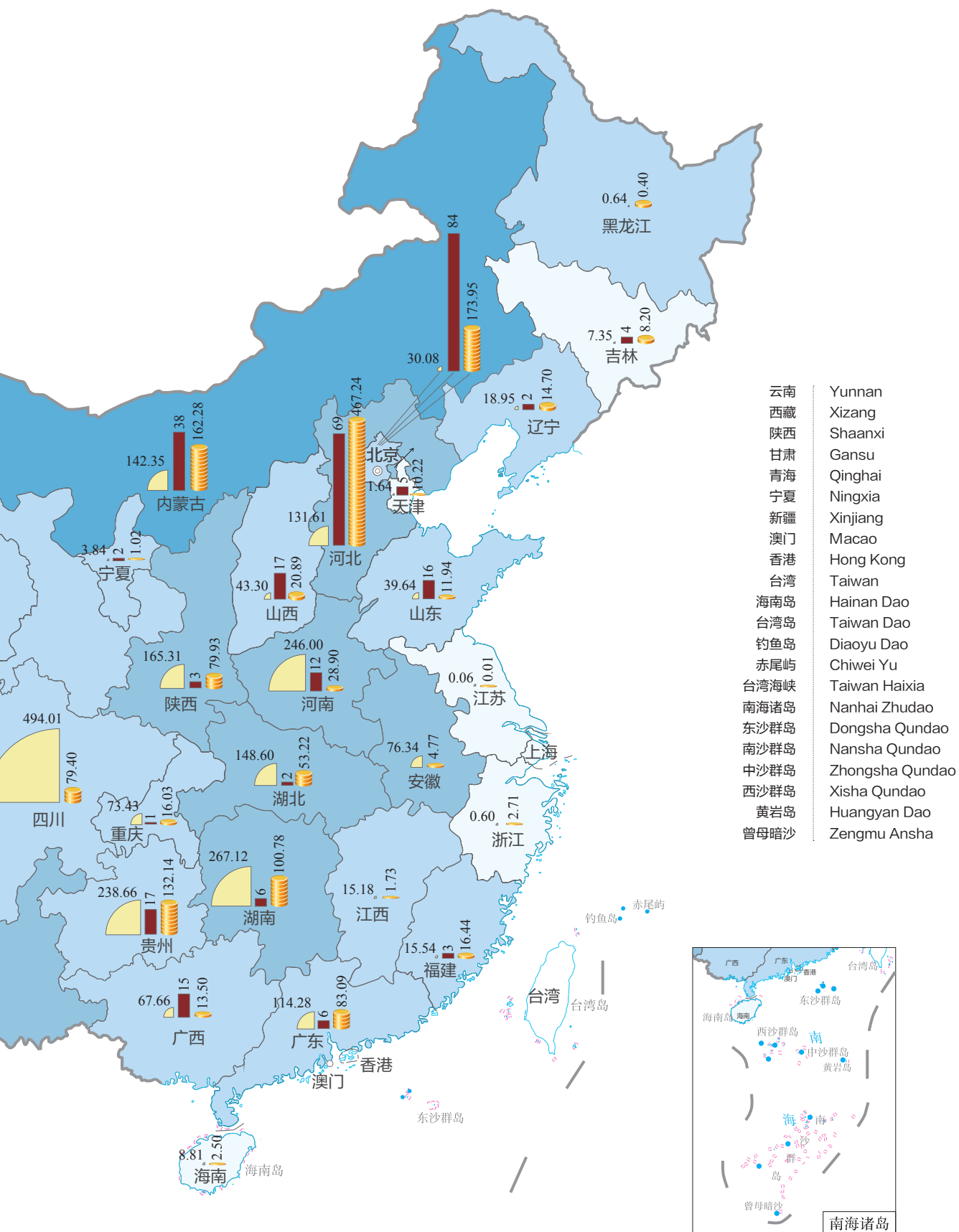
图 3-1 2025 年全国洪涝灾害分布图

Figure 3-1 Overview of flood disaster distribution nationwide in 2025



注 数据来源于应急管理部，香港特别行政区、澳门特别行政区、台湾省资料暂缺。

Note The data come from the Ministry of Emergency Management, data of Hong Kong SAR, Macao SAR and Taiwan are currently unavailable.



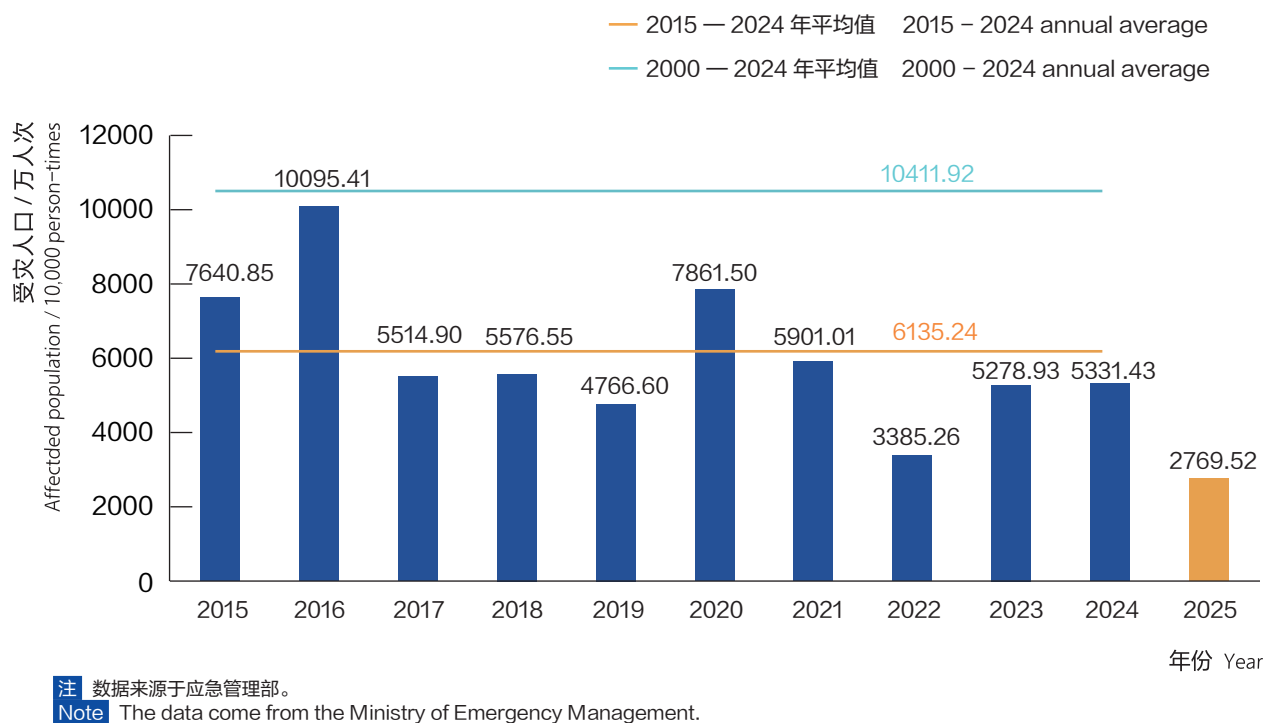


图 3-2 2015—2025 年全国因洪涝受灾人口
Figure 3-2 Population affected by floods nationwide, 2015-2025

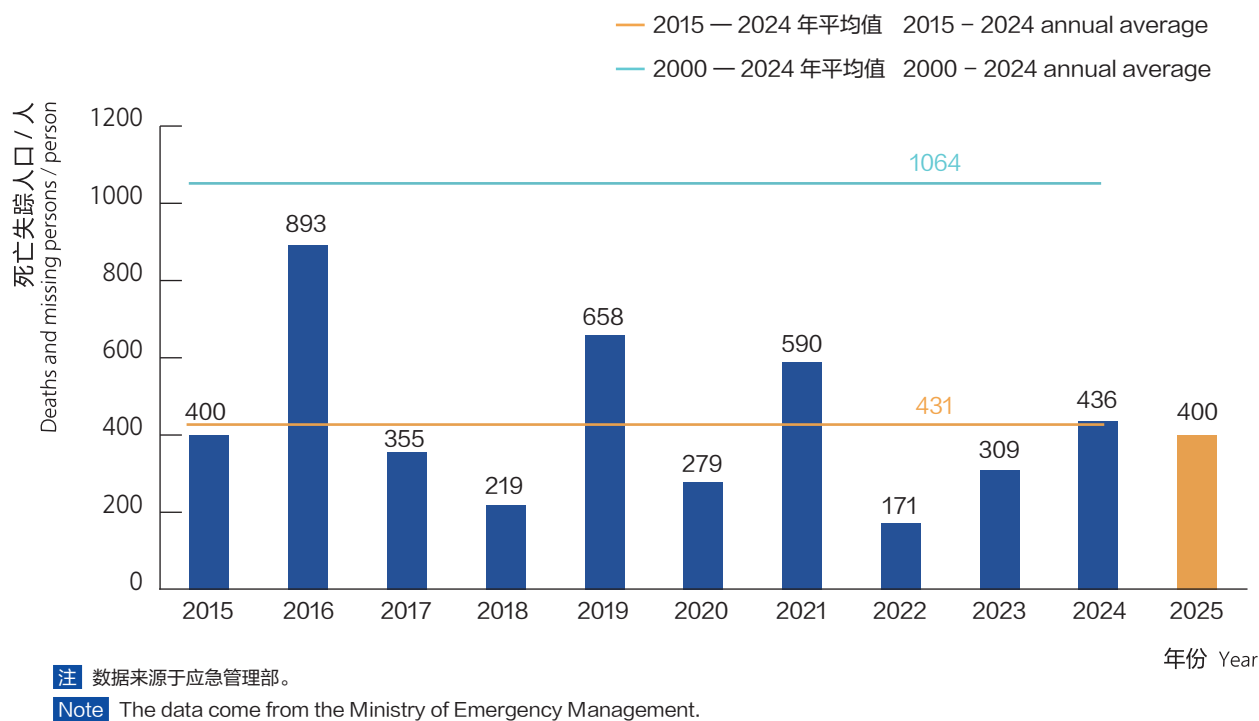


图 3-3 2015—2025 年全国因洪涝死亡失踪人口
Figure 3-3 Deaths and missing persons attributed to floods nationwide, 2015-2025

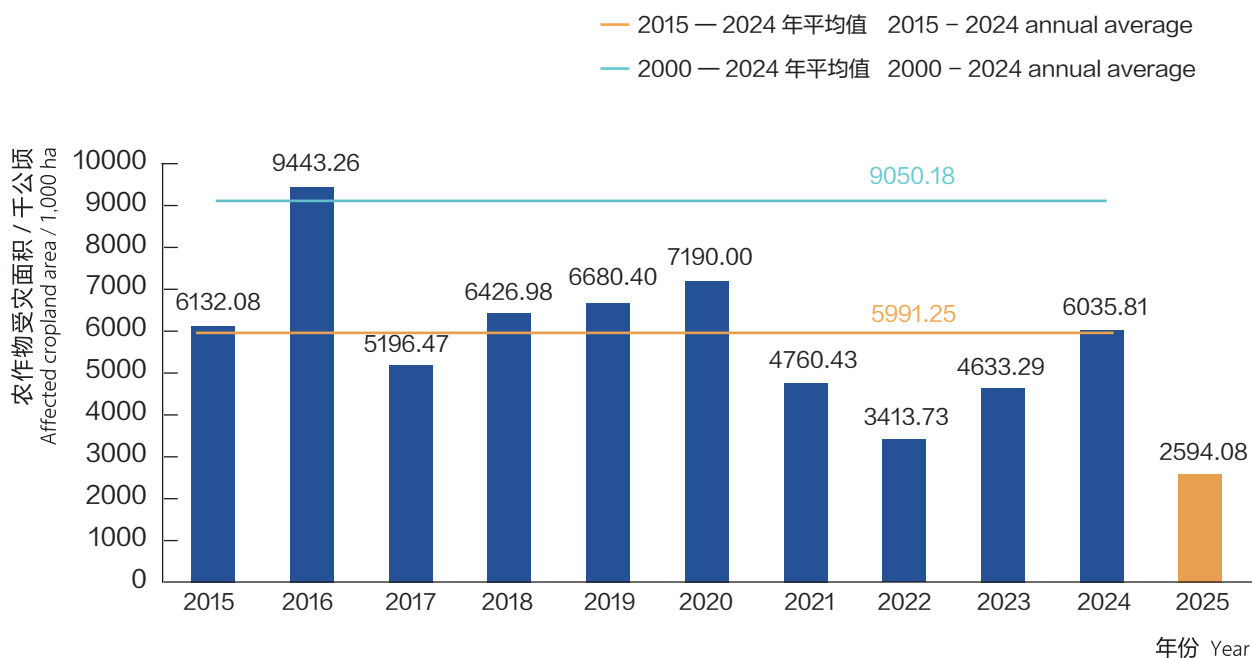


图 3-4 2015—2025 年全国因洪涝农作物受灾面积

Figure 3-4 Cropland area affected by floods nationwide, 2015-2025

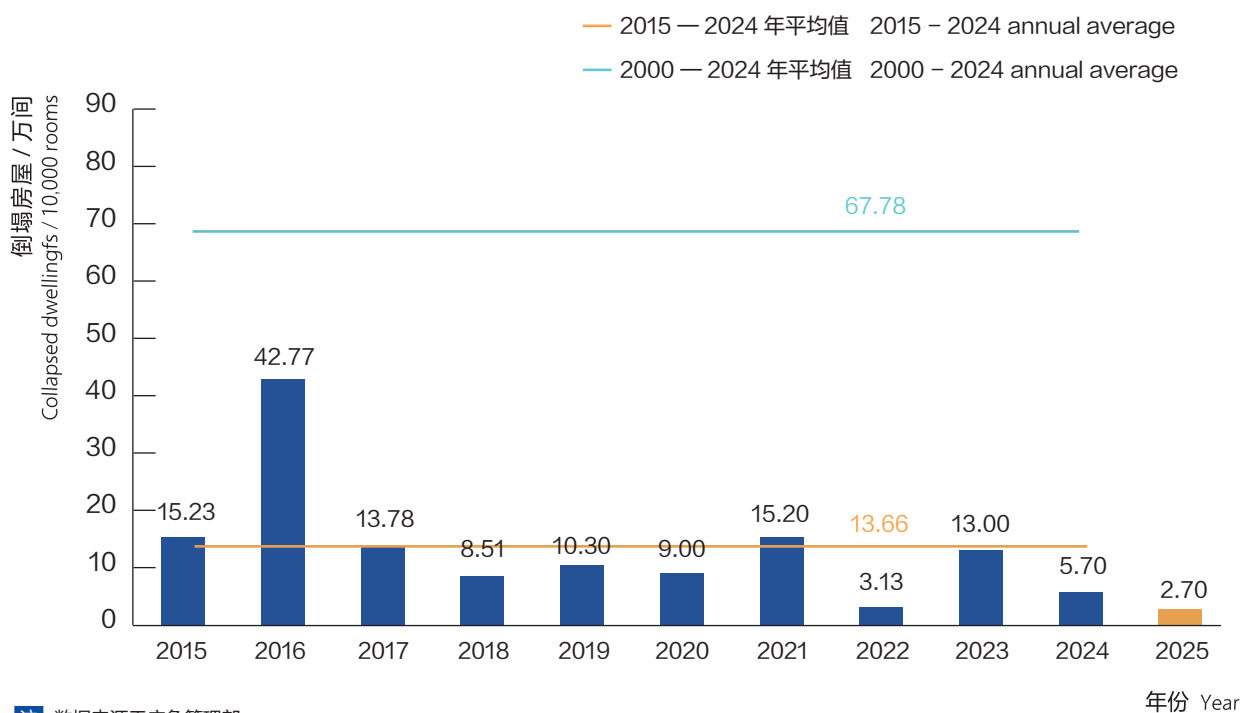
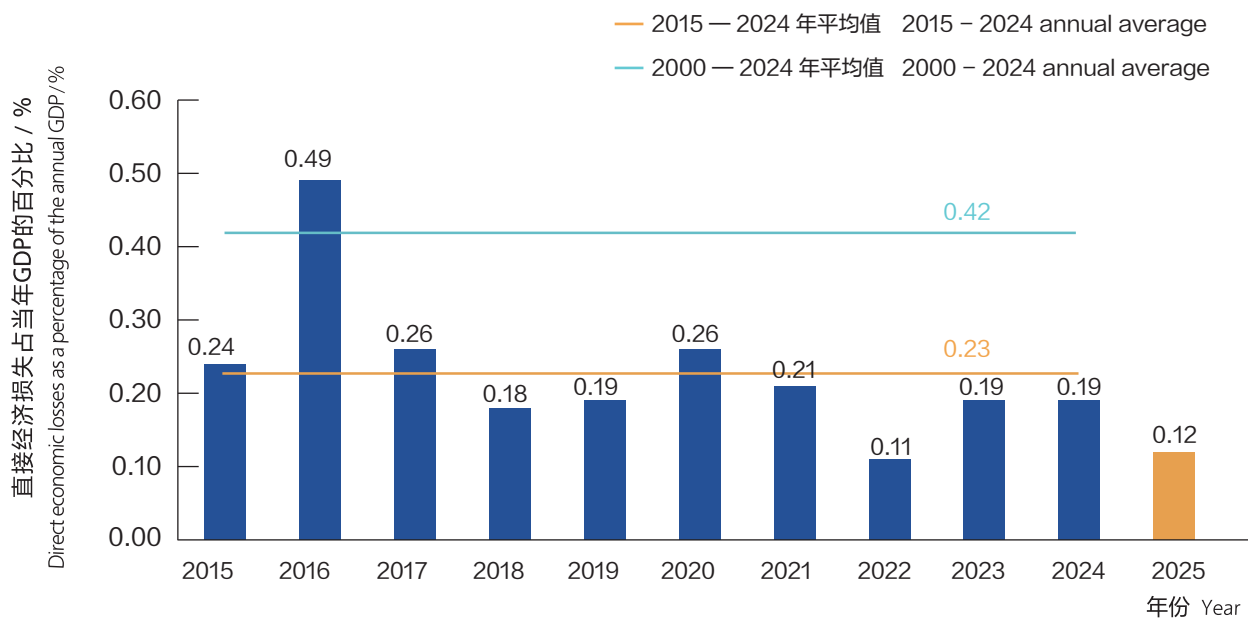


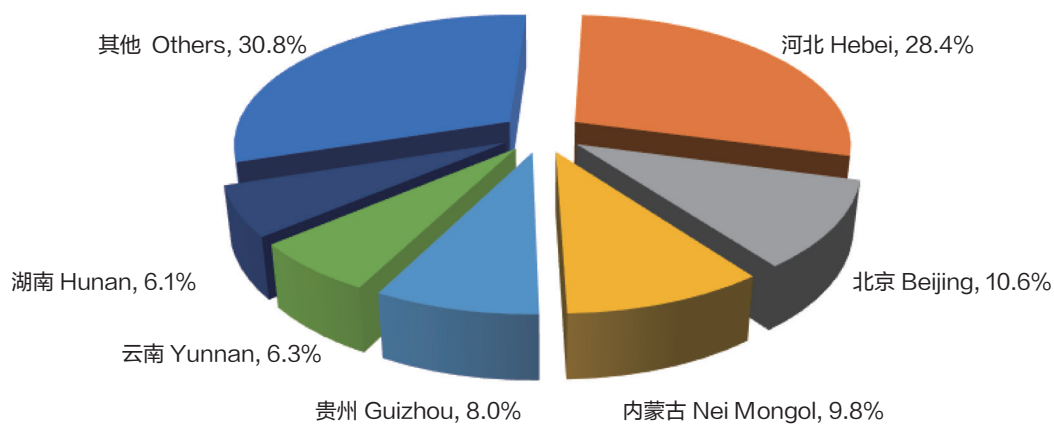
图 3-5 2015—2025 年全国因洪涝倒塌房屋

Figure 3-5 Collapsed dwellings attributed to floods nationwide, 2015-2025



注 数据来源于应急管理部。
Note The data come from the Ministry of Emergency Management.

图 3-6 2015—2025 年全国因洪涝直接经济损失占当年 GDP 的百分比
Figure 3-6 National direct economic losses attributed to floods as a percentage of the annual GDP, 2015–2025



注 数据来源于应急管理部。
Note The data come from the Ministry of Emergency Management.

图 3-7 2025 年全国因洪涝直接经济损失分布
Figure 3-7 A provincial break-down of direct economic losses attributed to floods nationwide in 2025

3.1.2 水利工程设施灾损情况

2025 年，洪涝共造成全国 1508 座水库（其中 37 座大型、189 座中型、1282 座小型水库）、24867 处 4469.25 千米堤防、41332 处护岸、2678 座水闸、10017 座塘坝、3014 个水文测站、2088 眼机电井、2166 座机电泵站、407 座水电站（其中 21 座大中型、386 座小型）不同程度受损。

水利工程设施直接经济损失 495.94 亿元，较近 10 年均值偏多 3.96%，其中河北 88.57 亿元、北京 81.68 亿元、广东 48.25 亿元，3 省（直辖市）损失占全国损失 44.1%。

3.1.2 Losses and damages to water projects and facilities

In 2025, floods damaged, to varying degrees, 1,508 reservoirs (including 37 large, 189 medium-sized, and 1,282 small), 24,867 sections of embankments totaling 4,469.25 km, 41,332 bank revetments, 2,678 sluices, 10,017 small pond reservoirs, 3,014 hydrologic stations, 2,088 electromechanical wells, 2,166 electromechanical pumping stations, and 407 hydropower stations (21 large/medium and 386 small).

Direct economic losses to water projects and facilities totaled 49.594 billion RMB, 3.96% higher than the preceding decadal average. Of this total, Hebei Province accounted for 8.857 billion RMB, Beijing for 8.168 billion RMB, and Guangdong Province for 4.825 billion RMB; these three provinces/municipality claimed 44.1% of the national total losses.

表 3-3 2025 年全国水利设施灾损情况

Table 3-3 Losses and damages to water projects and facilities nationwide in 2025

地区 Region	损坏水库 / 座 Damaged reservoirs/units		损坏堤防 Damaged embankments		损坏 护岸 / 处 Damaged bank revetments/ sites	损坏 水闸 / 座 Damaged sluices/ units	损坏 塘坝 / 座 Damaged small pond reservoirs/ units	损坏水文测站 / 个 Damaged hydrologic stations/ units	损坏 水电站 / 座 Damaged hydropower stations/ units	水利工程设施直接经 济损失 / 亿元 Direct economic losses to water project and facilities/100 million RMB
	大中型 Large and medium- sized	小型 Small	数量 / 处 Number of sites	长度 / 千米 Length/km						
全国 Nationwide	226	1282	24867	4469.25	41332	2678	10017	3014	407	495.94
北京 Beijing	9	14	153	251.10	1128	10	58	249		81.68
天津 Tianjin	1		3	5.79	19	13	10	4		6.00
河北 Hebei	20	67	836	265.91	7604	83	94	99	31	88.57
山西 Shanxi	3	13	223	40.90	141	8	1	98		5.13
内蒙古 Nei Mongol	13	89	7590	968.58	2920	41	90	15	2	22.31
辽宁 Liaoning	2	7	904	188.25	1122	6	6	14		7.91
吉林 Jilin		5	141	48.55	119					3.47
黑龙江 Heilongjiang	1	2	26	6.49	65					0.55
上海 Shanghai										
江苏 Jiangsu	1		41	26.71	104	96	3			1.68
浙江 Zhejiang		1	311	15.41	356	4	40	11		1.88
安徽 Anhui		10	223	22.66	895	44	484	37		2.58
福建 Fujian		4	309	49.20	1485	95	50	226		8.30
江西 Jiangxi	1	80	198	17.79	1027	253	234	41	6	2.54
山东 Shandong	3	35	61	21.11	521	13	29	149		9.28
河南 Henan	18	41	1087	118.85	1195	197	42	16		9.06

续表 Continued

地区 Region	损坏水库 / 座 Damaged reservoirs/units		损坏堤防 Damaged embankments		损坏 护岸 / 处 Damaged bank revetments/ sites	损坏 水闸 / 座 Damaged sluices/ units	损坏 塘坝 / 座 Damaged small pond reservoirs/ units	损坏水文测站 / 个 Damaged hydrologic stations/ units	损坏 水电站 / 座 Damaged hydropower stations/ units	水利设施直接经 济损失 / 亿元 Direct economic losses to water project and facilities/100 million RMB
	大中型 Large and medium- sized	小型 Small	数量 / 处 Number of sites	长度 / 千米 Length/km						
湖北 Hubei	18	48	357	84.78	4107	270	1329	251	25	22.30
湖南 Hunan	6	47	854	67.59	8826	473	2498	450	41	29.82
广东 Guangdong	59	207	1363	334.88	2576	510	217	14	84	48.25
广西 Guangxi	4	34	1478	84.38	1956	207	131	332	34	17.57
海南 Hainan	24	142	89	10.38	41	46	24	53	4	4.01
重庆 Chongqing		70	612	82.93	811	32	1108	240	16	6.76
四川 Sichuan	4	127	971	207.69	1324	76	3010	168	53	27.35
贵州 Guizhou	4	32	908	243.64	211	28	87	227	36	19.92
云南 Yunnan	5	102	2162	539.12	994	73	347	40	71	27.45
西藏 Xizang			165	46.80	26	2		8		1.83
陕西 Shaanxi	15	37	1917	274.46	383	8	40	87	2	13.31
甘肃 Gansu	4	11	1471	357.53	327	15	4	58	1	20.32
青海 Qinghai		5	248	37.87	47	2	24		1	2.34
宁夏 Ningxia	9	52	3		384	61	57	16		0.95
新疆 Xinjiang			139	46.79	37	6		12		1.03
水利部直属 Directly managed by MWR	2		24	3.11	581	6		99		1.79

注 水利设施灾损包括地震引发的损失。空白表示无灾情上报。新疆数据包括新疆生产建设兵团。

Note Earthquake-induced losses and damages to water projects and facilities are included. Blanks indicate no such disaster reports. The data for Xinjiang includes that from the Xinjiang Production and Construction Corps.

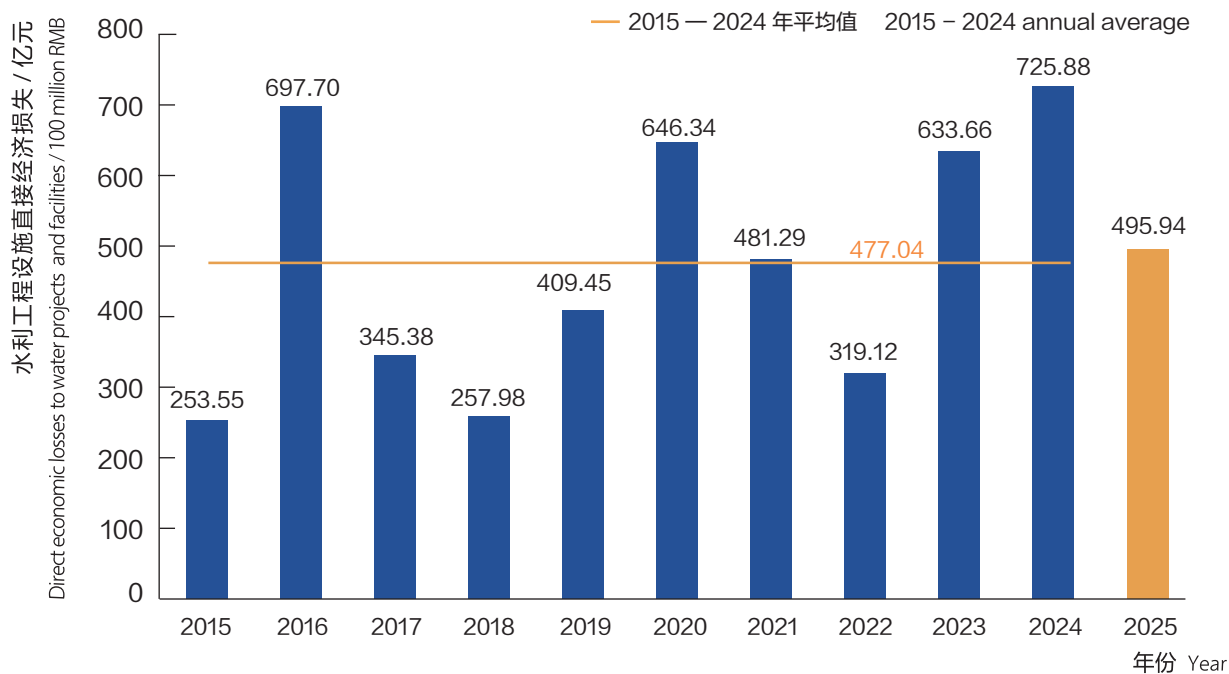


图 3-8 2015—2025 年全国水利设施直接经济损失
Figure 3-8 Direct economic losses to water projects and facilities nationwide, 2015-2025

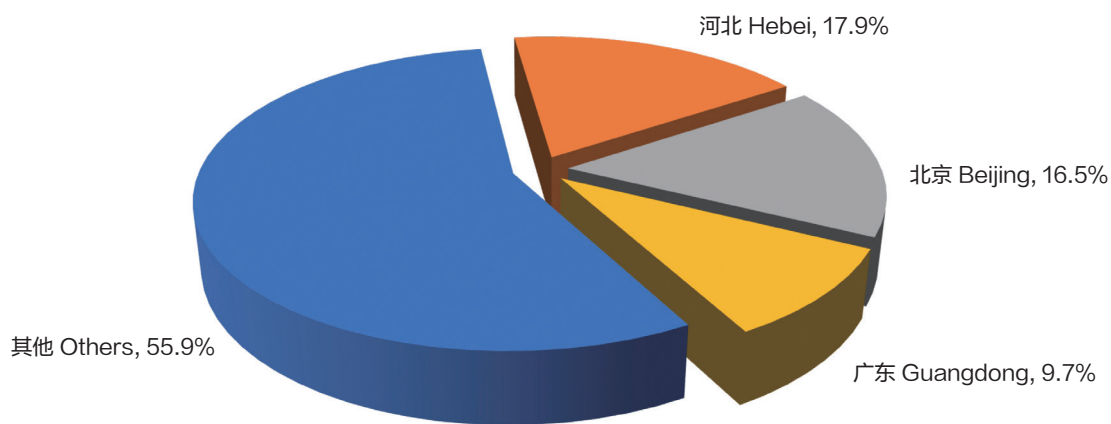


图 3-9 2025 年全国水利设施直接经济损失分布
Figure 3-9 A provincial break-down of direct economic losses to water projects and facilities nationwide in 2025

3.2 干旱灾情

2025 年全国农作物因旱受灾面积 1862.22 千公顷，较近 10 年平均值偏少 71.2%；农作物因旱绝收面积 100.01 千公顷，较近 10 年平均值偏少 84.9%；因旱粮食损失 17.90 亿千克，较近 10 年平均值偏少 82.1%；有 59.38 万人因旱饮水困难，较近 10 年平均值偏少 88.1%；有 51.15 万头大牲畜因旱饮水困难，较近 10 年平均值偏少 88.0%；直接经济损失 86.48 亿元，较近 10 年平均值偏少 76.6%。

3.2 Drought Disasters

In 2025, a total of 1,862,220 ha of cropland were affected by droughts nationwide, 71.2% less than the preceding decadal average; of these, a total of 100,010 ha suffered crop failure, 84.9% lower than the preceding decadal average. The grain yield loss attributed to droughts amounted to 1.790 billion kg, 82.1% lower than the preceding decadal average; 593,800 people experienced difficulties accessing drinking water due to drought, 88.1% lower than the preceding decadal average; 511,500 head of large livestock experienced difficulties accessing drinking water due to drought, 88.0% lower than the preceding decadal average; direct economic losses amounted to 8.648 billion RMB, down by 76.6% from the preceding decadal average.

表 3-4 2025 年全国农作物因旱受灾面积、绝收面积情况

Table 3-4 Cropland area affected and failed by drought nationwide in 2025

地区 Region	农作物因旱受灾面积 / 千公顷 Cropland area affected by drought/1,000 ha	农作物因旱绝收面积 / 千公顷 Cropland area failed by drought/1,000 ha	地区 Region	农作物因旱受灾面积 / 千公顷 Cropland area affected by drought/1,000 ha	农作物因旱绝收面积 / 千公顷 Cropland area failed by drought/1,000 ha
全国 Nationwide	1862.22	100.01	河南 Henan	383.06	17.55
北京 Beijing			湖北 Hubei	189.05	6.94
天津 Tianjin			湖南 Hunan	62.94	4.34
河北 Hebei			广东 Guangdong	0.01	
山西 Shanxi	112.77	14.18	广西 Guangxi	277.09	4.34
内蒙古 Nei Mongol	24.96		海南 Hainan		
辽宁 Liaoning	1.94	0.56	重庆 Chongqing	46.94	3.89
吉林 Jilin			四川 Sichuan	107.99	5.33
黑龙江 Heilongjiang			贵州 Guizhou	1.25	
上海 Shanghai			云南 Yunnan	16.66	0.42
江苏 Jiangsu			西藏 Xizang	0.12	0.08
浙江 Zhejiang	0.13		陕西 Shaanxi	368.45	27.67
安徽 Anhui			甘肃 Gansu	13.22	
福建 Fujian	4.67	0.29	青海 Qinghai	34.41	
江西 Jiangxi	147.73	7.10	宁夏 Ningxia	36.44	6.75
山东 Shandong	32.30	0.57	新疆 Xinjiang	0.09	

注

数据来源于应急管理部。空白表示无灾情上报。新疆数据包括新疆生产建设兵团。

Note

The data come from the Ministry of Emergency Management. Blanks indicate no such disaster reports. The data for Xinjiang includes that from the Xinjiang Production and Construction Corps.

表 3-5 2025 年全国因旱饮水困难情况

Table 3-5 Difficulties accessing drinking water due to drought nationwide in 2025

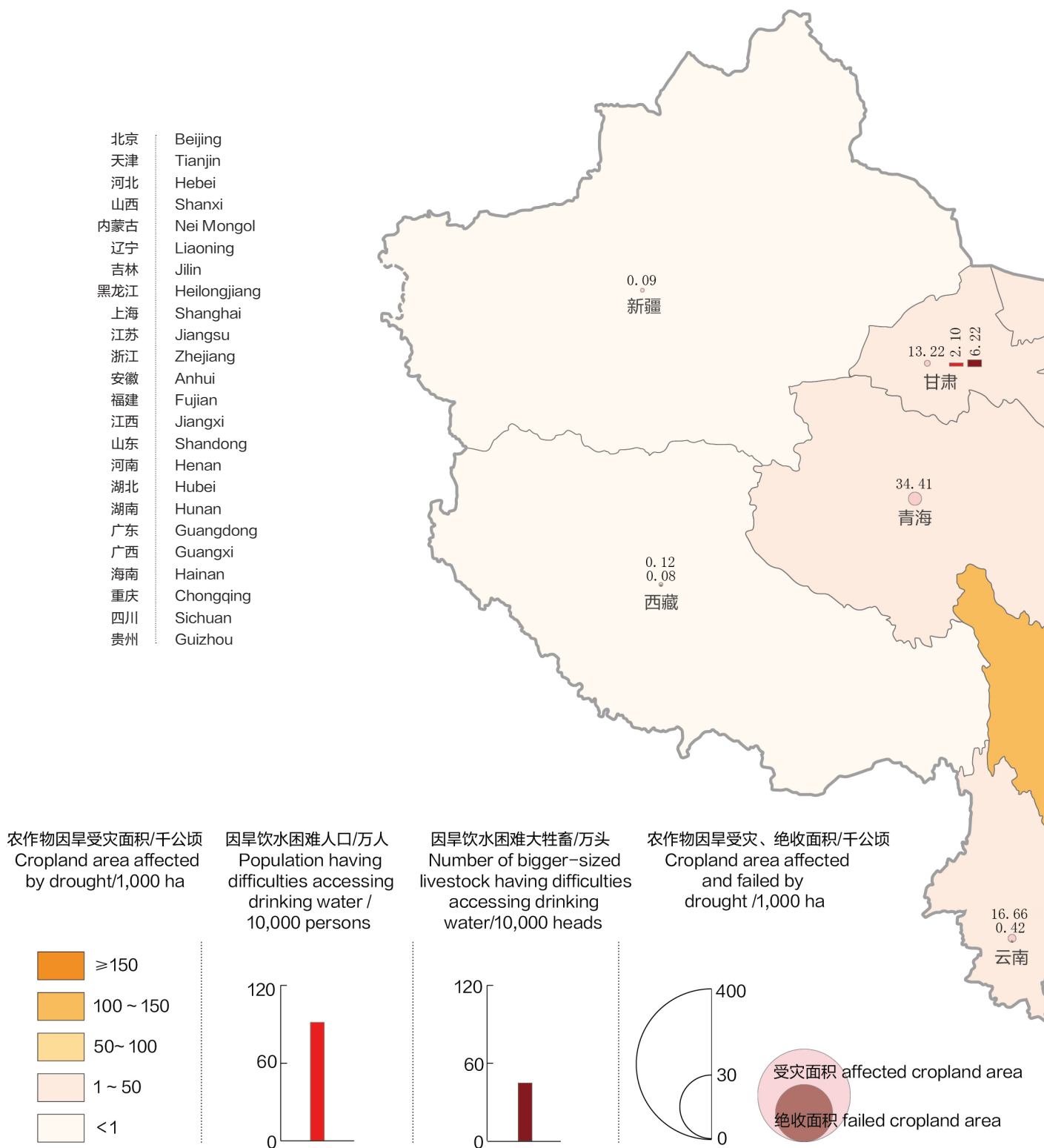
地区 Region	因旱饮水困难 人口 / 万人 Population having difficulties accessing drinking water/10,000 persons	因旱饮水困难 大牲畜 / 万头 Number of bigger-sized livestock having difficulties accessing drinking water/10,000 heads	地区 Region	因旱饮水困难 人口 / 万人 Population having difficulties accessing drinking water /10,000 persons	因旱饮水困难 大牲畜 / 万头 Number of bigger-sized livestock having difficulties accessing drinking water/10,000 heads
全国 Nationwide	59.38	51.15	河南 Henan		
北京 Beijing			湖北 Hubei	4.44	2.56
天津 Tianjin			湖南 Hunan	0.13	
河北 Hebei			广东 Guangdong		
山西 Shanxi			广西 Guangxi	12.05	1.11
内蒙古 Nei Mongol	0.01	18.52	海南 Hainan		
辽宁 Liaoning			重庆 Chongqing	4.45	4.16
吉林 Jilin			四川 Sichuan	7.54	3.75
黑龙江 Heilongjiang			贵州 Guizhou		
上海 Shanghai			云南 Yunnan	28.55	12.17
江苏 Jiangsu			西藏 Xizang		
浙江 Zhejiang			陕西 Shaanxi		2.54
安徽 Anhui			甘肃 Gansu	2.10	6.22
福建 Fujian			青海 Qinghai		
江西 Jiangxi	0.08	0.11	宁夏 Ningxia	0.03	0.01
山东 Shandong			新疆 Xinjiang		

注 空白表示无灾情上报。新疆数据包括新疆生产建设兵团。

Note Blanks indicate no such disaster reports. The data for Xinjiang includes that from the Xinjiang Production and Construction Corps.

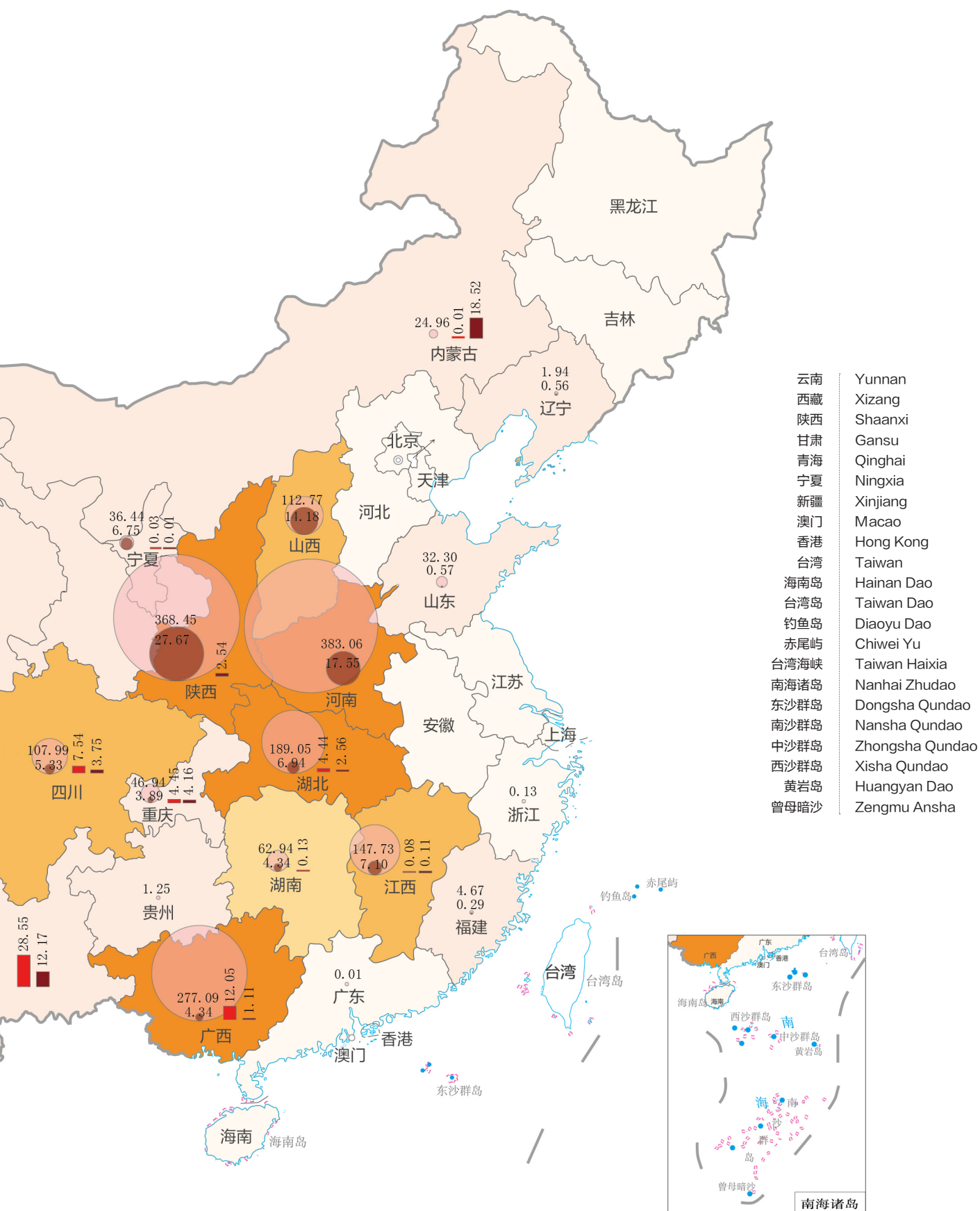
图 3-10 2025 年全国干旱灾害分布图

Figure 3-10 Overview of drought disaster distribution nationwide in 2025



注 农作物因旱受灾面积、绝收面积数据来源于应急管理部，香港特别行政区、澳门特别行政区、台湾省资料暂缺。

Note The data of cropland area affected by drought and cropland area failed by drought come from the Ministry of Emergency Management, data of Hong Kong SAR, Macao SAR and Taiwan are currently unavailable.



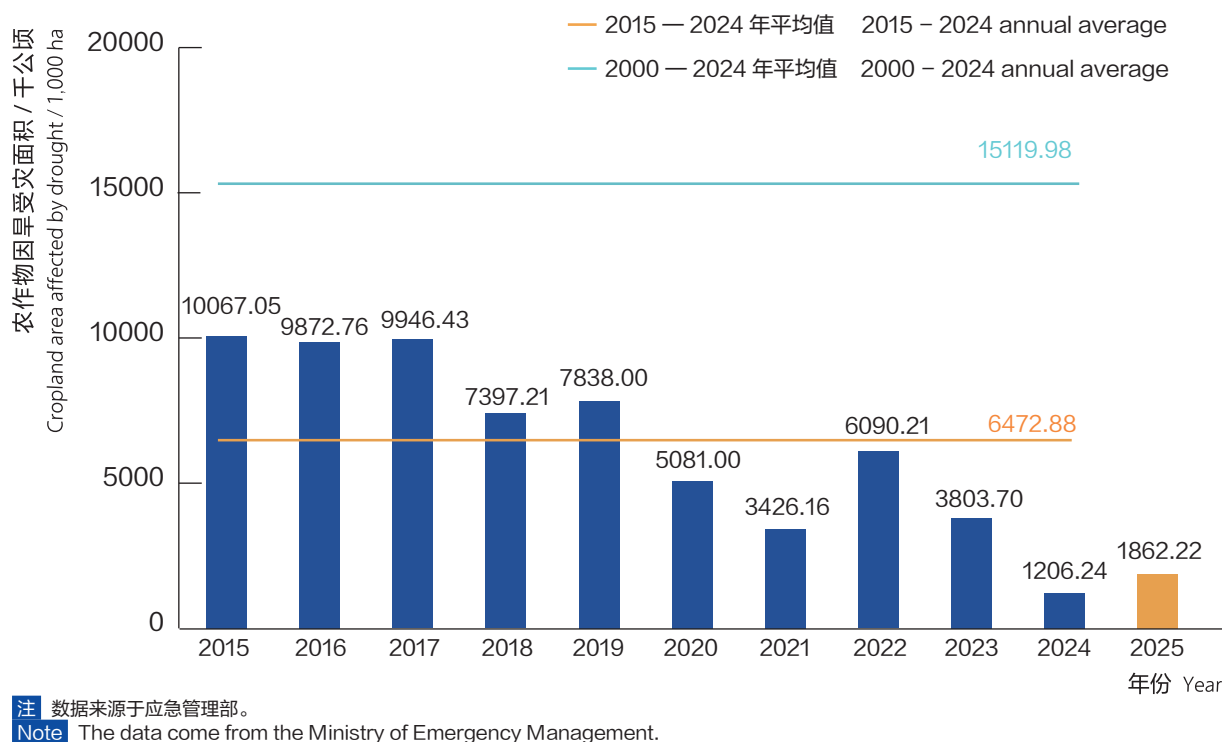


图 3-11 2015—2025 年全国农作物因旱受灾面积
Figure 3-11 Cropland area affected by drought nationwide, 2015-2025

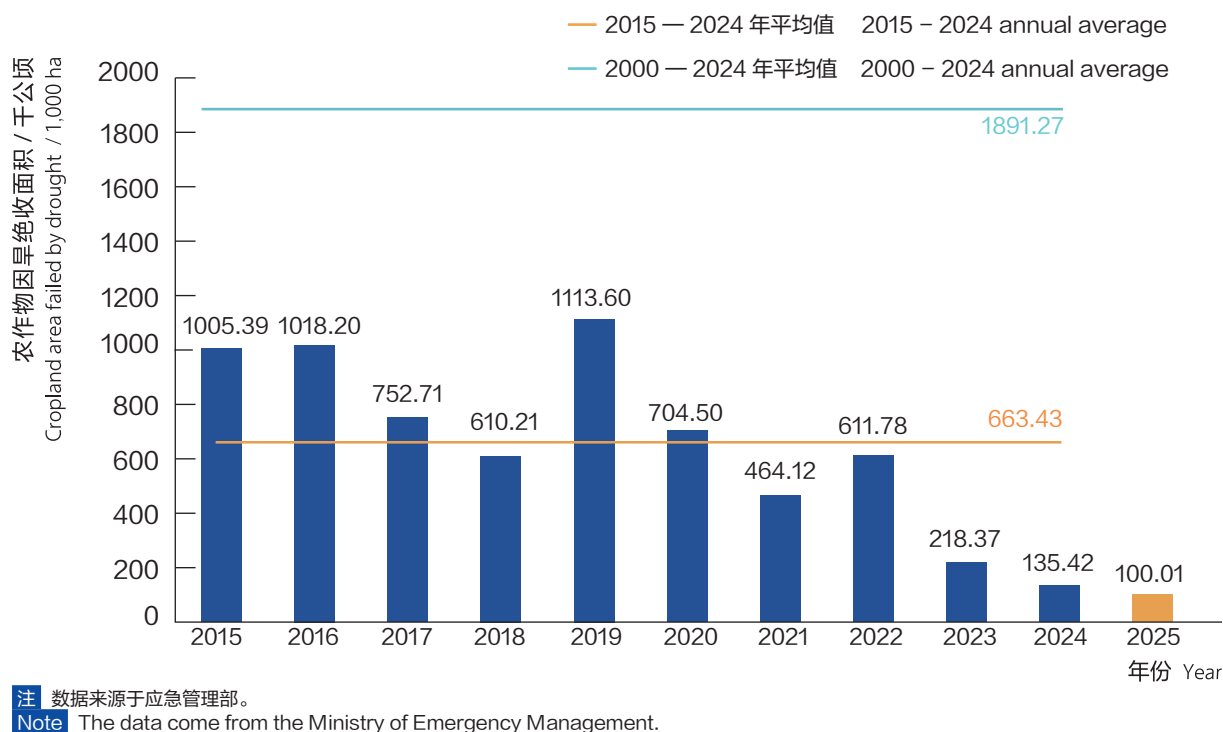


图 3-12 2015—2025 年全国农作物因旱绝收面积
Figure 3-12 Cropland area failed by drought nationwide, 2015-2025

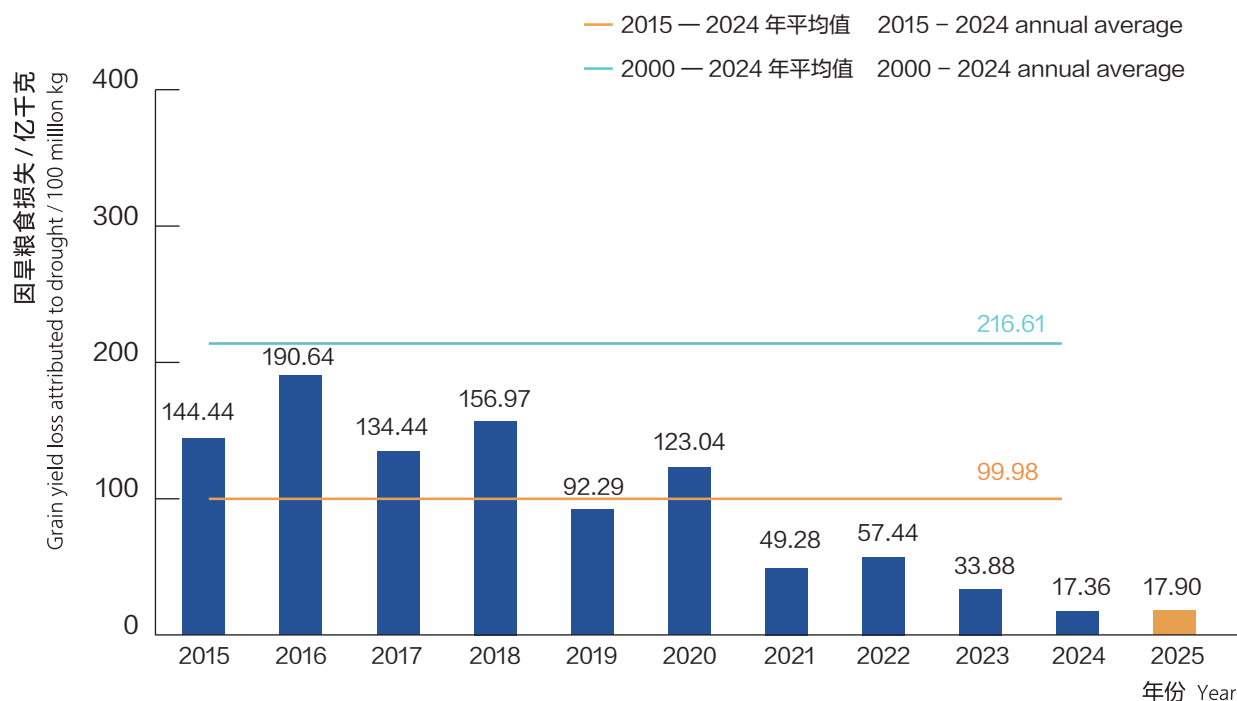


图 3-13 2015—2025 年全国因旱粮食损失

Figure 3-13 Grain yield loss attributed to drought nationwide, 2015-2025

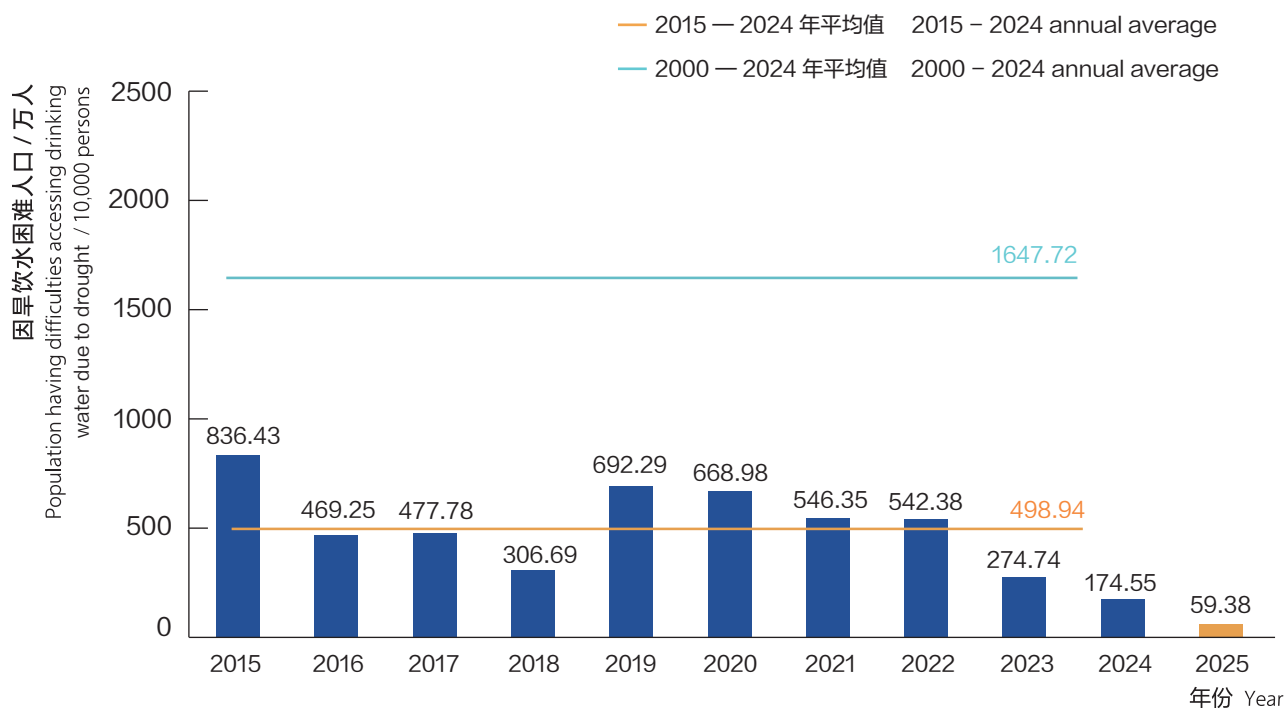


图 3-14 2015—2025 年全国因旱饮水困难人口

Figure 3-14 Population having difficulties accessing drinking water due to drought nationwide, 2015-2025

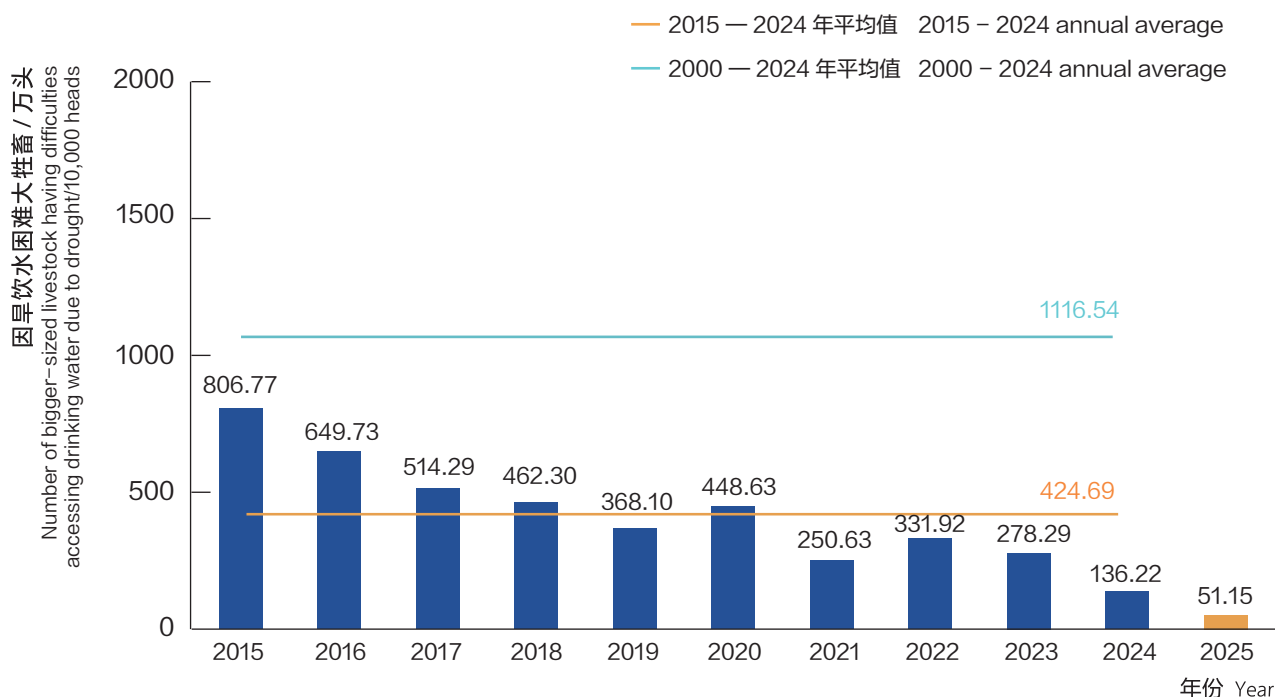


图 3-15 2015—2025 年全国因旱饮水困难大牲畜

Figure 3-15 Number of bigger-sized livestock having difficulties accessing drinking water due to drought nationwide, 2015-2025

3.3 典型中小河流洪水和山洪灾害

3.3.1 广西龙胜“5·23”山洪泥石流灾害

5 月 23 日 4 时许，柳江流域芙蓉河一级支流冷界头溪（河长 3.55 千米，集雨面积为 7.5 平方千米）遭遇短时强降雨，最大 1 小时降雨量 41.5 毫米。受短时强降雨影响，加之河床内松散堆积体失稳下滑，龙胜县泗水乡三舍村冷界头三组突发山洪泥石流灾害，距离冷界头溪源头 1.95 千米处洪峰流量为 91.9 立方米每秒，导致 10 座民房垮塌、8 名村民死亡。

3.3 Major Floods and Flash Floods in Small and Medium-Sized Rivers

3.3.1 The “May 23” flash flood and debris flow disaster in Longsheng, Guangxi

At around 4:00 on May 23, Lengjietou Creek—a primary tributary of the Furong River in the Liujiang River Basin (3.55 km long, with a catchment area of 7.5 km²)—experienced short-duration heavy rainfall, with maximum hourly rainfall of 41.5 mm. Affected by the short-term heavy rainfall, coupled with the destabilization and slippage of loose sediment deposits within the riverbed, a flash flood and debris flow suddenly occurred in the Sanzu section of Lengjietou Creek, Sanshe Village, Sishui Township, Longsheng County. The peak flow reached 91.9 m³/s at a point 1.95 km from the source of the Lengjietou Creek, resulting in the collapse of 10 houses and the deaths of 8 villagers.



龙胜县泗水乡山洪泥石流灾害现场（摄于5月23日）

Scene of the flash flood and debris flow disaster in Sishui Township, Longsheng County (photographed on May 23)

3.3.2 广东绥江“25·6”洪涝灾害

6月14—17日，2025年第1号台风“蝴蝶”云系在绥江流域引发连续3次强降雨过程，降雨间隔时间短、雨区重合度高，最大过程面雨量肇庆市怀集县318.2毫米。17日22时，绥江干流大象（二）水文站（肇庆市怀集县）出现洪峰水位（62.17米），超历史实测记录最高水位1.31米，为超百年一遇洪水。洪水造成肇庆市45个乡镇33.8万人受灾、7.41万人转移。

3.3.3 贵州都柳江“6·18”洪涝灾害

6月18—28日，都柳江流域普降暴雨，流域面平均降雨量达388毫米，有10个雨量站点累计雨量超过600毫米，属典型长历时过程型暴雨。降雨导致都柳江及其支流寨蒿河、平江河（寨蒿河支流）同时暴发洪水，在榕江县城形成极端“洪水走廊”叠加效应。24日14时15分，榕江县城下游石灰厂水文站水位1.94米，相应流量11400立方米每秒，水位、流量均超历史实测记录。都柳江流域榕江县、从江县、三都县5天遭遇两次洪峰过境，榕江县城最大淹没水深约5米，三县水利、电力、交通、通信等基础设施遭受严重水损，直接经济损失分别达575411万元、211257万元、148374万元。



榕江县城道路被淹（摄于6月24日）

Submerged roads in Rongjiang County (photographed on June 24)

3.3.2 The “June 2025” flood disaster in Suijiang, Guangdong

From June 14 to 17, the cloud system associated with Typhoon Wutip, the No. 1 typhoon of 2025, triggered three consecutive episodes of heavy rainfall in the Suijiang River Basin. The intervals between rainfall events were short and the rain areas were highly overlapping, with the maximum rainfall of a single process reaching 318.2 mm in Huaiji County, Zhaoqing City. At 22:00 on the 17th, the peak flood level (62.17 m) was recorded at the Daxiang (Ⅱ) hydrologic station (Huaiji County, Zhaoqing City) on the Suijiang mainstream, breaking the historical highest by 1.31 m and marking a flood event with an over-100-year return period. The flood affected 338,000 people across 45 townships in Zhaoqing City, with 74,100 people evacuated.

3.3.3 The “June 18” flood disaster on the Dulu River in Guizhou

From June 18 to 28, the Dulu River Basin experienced widespread rainstorms, with an average rainfall of 388 mm across the basin. Cumulative rainfall exceeded 600 mm at 10 monitoring stations, constituting a typical long-duration rainstorm event. The rainfall triggered concurrent flooding in the Dulu River and its tributaries—the Zhaihao and its tributary Pingjiang, creating an extreme “flood corridor” phenomena in Rongjiang County. At 14:15 on the 24th, the water level at Shihuichang hydrologic station downstream of Rongjiang County reached 1.94 m, with a corresponding flow of 11,400 m³/s; both the water level and flow exceeded historical records. Over a five-day period, Rongjiang, Congjiang, and Sandu counties in the Dulu River Basin experienced two flood peaks and the maximum inundation depth in Rongjiang County reached approximately 5 m; water conservancy, power, transportation, and communications infrastructure suffered severe damage by inundation; and the three counties suffered direct economic losses amounting to 575.411 million RMB, 211.257 million RMB, and 148.374 million RMB, respectively.



3.3.4 海河流域潮白河支流清水河“25·7”洪涝地质灾害

7月23日8时至28日14时，海河流域潮白河支流清水河流域（集水面积597平方千米）持续遭遇强降雨，流域面降雨量428.7毫米，24个雨量站中的17个站降雨量超过400毫米，最大过程雨量河北省兴隆县六道河镇603.5毫米，为近30年最大。持续强降雨致清水河流域土壤含水量迅速饱和，干支流洪峰叠加，引发远超百年一遇、超历史记录特大洪水。清水河葡萄园水文站7月28日8时洪峰流量3160立方米每秒，为百年一遇设计洪水标准2100立方米每秒的1.5倍、历史最大洪水1200立方米每秒（1890年）的2.63倍。

清水河特大暴雨引发山洪、泥石流、滑坡复合灾害，致河北省承德市兴隆县、滦平县6个乡镇16个行政村29个灾害点的61人死亡失踪，时间多发生在夜间至凌晨，地点多位于小流域支沟沟口。上游洪水演进至清水河北京密云太师屯段，因干支流洪峰叠加，洪水携带大量漂流物经出山口“几”字弯急转后直冲清水河右堤，在佛山东路跨河桥处壅塞，致右堤漫溃、跨河桥引桥垮塌，7月28日5时10分左右，洪水快速涌入太师屯镇葡萄园村，导致地势相对低洼的养老照料中心长时间被淹，致太师屯镇养老照料中心32人死亡。



滦平县洪涝地质灾害受灾最严重的西沟村（摄于7月29日）

Xigou Village in Luanping County, the area hardest hit by flood and geological disasters (photographed on July 29)

3.3.4 The “July 2025” flood and geological disaster on the Qingshui River, a tributary of the Chaobai River in the Haihe River Basin

From 8:00 on July 23 to 14:00 on July 28, the Qingshui River Basin (a tributary of the Chaobai River in the Haihe River Basin, with a catchment area of 597 km²) experienced continuous heavy rainfall. The basin-wide rainfall totaled 428.7 mm, 17 of the 24 rainfall stations recorded rainfall amounts of over 400 mm, and the highest rainfall of a single process of 603.5 mm was recorded in Liudaohe Town, Xinglong County, Hebei Province—the highest in nearly 30 years. The persistent heavy rainfall rapidly saturated the soil in the Qingshui River Basin, and flood peaks on the mainstream and tributaries overlapped, triggering an extreme flood far exceeding a 100-year flood intensity and breaking historical records. At 8:00 on July 28, the food peak flow at Putaoyuan Hydrologic Station on the Qingshui River reached 3,160 m³/s—1.5 times the 100-year flood design standard of 2,100 m³/s and 2.63 times the historical maximum flood magnitude of 1,200 m³/s (recorded in 1890).

The extreme rainstorm along the Qingshui River triggered a combination of flash floods, debris flow, and landslides, resulting in 61 deaths and missing persons across 29 damaged sites in 16 administrative villages within 6 townships of Xinglong and Luanping counties, Chengde City, Hebei Province. Most incidents occurred between late night and early morning, primarily at the mouths of tributaries in small watersheds. As the upstream floodwaters reached the Taishitun section of the Qingshui River in Miyun District, Beijing, the combined peak flows of the mainstream and tributaries flushed down a large amount of debris all the way to make a sharp upside-down U-turn at the mountain foot outlet and crash directly on the right embankment of the Qingshui River. The heavy-loaded floodwaters jammed around the Foshan East Road bridge, causing overflow over the right embankment and the collapse of the bridge's approach. At approximately 5:10 on July 28, floodwaters surged into Putaoyuan Village, Taishitun Town, causing the relatively low-lying elderly care center to be submerged for an extended period and resulting in the deaths of 32 people at the center.

3.3.5 甘肃榆中“8·7”山洪泥石流灾害

8月7—8日，甘肃省兰州市榆中县遭遇连续强降雨，暴雨中心榆中兴隆山站24小时（7日18时至8日18时）累计降雨量220.2毫米，突破榆中日降雨量历史记录极值，达到榆中县年平均面降雨量382.6毫米的58%，超200年一遇。连续强降雨导致龛谷河流域（集水面积157平方千米）、兴隆河流域（集水面积126平方千米）坡面产汇流和土体渗流同步增强，快速汇集成高速洪流，强烈冲蚀谷坡和沟道，引发多处浅层滑坡并形成山洪泥石流，兴隆河榆中水文站洪峰流量368立方米每秒，龛谷河尖山村洪峰流量197立方米每秒，均达到200年一遇。山洪泥石流在狭窄山谷高速下泄，致使道路、供电、通信、水文测站等基础设施中断损坏，一些村庄无法收到预警信息，加之灾害发生在深夜，造成榆中县11个乡镇3万余人受灾、51人死亡失踪。



榆中县山洪泥石流灾害重灾区现场（摄于8月11日）

The severely damaged area of the flash flood and debris flow disaster in Yuzhong County (photographed on August 11)

3.3.5 The “August 7” flash flood and debris flow disaster in Yuzhong, Gansu

From August 7 to 8, continuous rainstorms hit Yuzhong County, Lanzhou City, Gansu Province. The Xinglongshan Station in Yuzhong, located at the epicenter of the rainstorm, recorded cumulative rainfall of 220.2 mm over 24 hours (from 18:00 on the 7th to 18:00 on the 8th). This broke the historical record for daily rainfall in Yuzhong, reached 58% of the county's annual average rainfall of 382.6 mm, and exceeded a 200-year flood magnitude. The continuous heavy rainfall caused intensified surface runoff and soil seepage in the Kangu River basin (catchment area 157 km²) and the Xinglong River basin (catchment area 126 km²), leading to the formation of high-velocity torrents. The torrents severely eroded valley slopes and gully channels, triggering multiple shallow landslides and forming flash floods and debris flows. The flood peak flow reached 368 m³/s at Yuzhong Hydrologic Station on the Xinglong River and 197 m³/s at Jianshan Village on the Kangu River, both reaching a 200-year flood magnitude. The flash floods and debris flows rushed down narrow valleys at high speeds, disrupting and damaging roads, power lines, communication networks, and hydrological monitoring stations. Some villages were unable to receive alerts, and because the disaster occurred late at night, more than 30,000 people in 11 townships of Yuzhong County were affected, with 51 people dead or missing.



3.3.6 内蒙古乌拉特后旗“8·16”山洪灾害

8月16日22时许，内蒙古自治区巴彦淖尔市乌拉特后旗乌盖苏木东乌盖沟（事发地上流域面积296平方千米）及其支沟巴拉根沟（集水面积14平方千米）遭遇强降雨。根据现场洪水调查和模型分析，支沟巴拉根沟半小时降雨量约58毫米，推算降雨频率约百年一遇。主沟东乌盖沟23时10分左右出现洪峰，流量约739立方米每秒；支沟巴拉根沟22时20分左右出现洪峰，流量约370立方米每秒。强降雨及引发的山洪，造成东乌盖沟河道内自驾野营者12人死亡。

3.3.6 The “August 16” flash flood disaster in Urat Rear Banner, Nei Mongol

At around 22:00 on August 16, heavy rainfall struck Dongwugai Gully (watershed area of 296 km² upstream of the struck site) and its tributary, Balagen Gully (catchment area of 14 km²), in Wugai Sumu, Urat Rear Banner, Bayannur City, Nei Mongol Autonomous Region. Based on on-site flood investigations and model analysis, the half-hour rainfall in the Balagen tributary was approximately 58 mm, indicating a rainfall intensity of a 100-year flood. The mainstream, Dongwugai Gully, reached its peak flow around 23:10, with a flow of approximately 739 m³/s; the tributary, Balagen Gully, reached its peak flow around 22:20, with a flow of approximately 370 m³/s. The heavy rainfall and resulting flash floods caused the deaths of 12 people who drove to the Dongwugai Gully for leisure camping along the riverbed.



乌拉特后旗乌盖苏木山洪灾害现场（摄于8月18日）

The flash flood destruction in Wugai Sumu, Urat Rear Banner (photographed on August 18)



防御行动

PREVENTION AND CONTROL



水利部及地方各级水利部门坚决贯彻落实习近平总书记关于防汛抗旱工作的重要讲话和指示批示精神，深入践行“两个坚持、三个转变”防灾减灾救灾理念，遵照党中央、国务院决策部署，锚定“人员不伤亡、水库不垮坝、重要堤防不决口、重要基础设施不受冲击”和确保城乡供水安全的目标，立体化织密气象卫星和测雨雷达、雨量站、水文站组成的雨水情监测预报“三道防线”，全链条筑牢水旱灾害预报、预警、预演、预案“四预”防控屏障，发挥水旱灾害防御工作体系效力，及时启动重大水旱灾害事件调度指挥机制，强化水工程统一调度、联合调度和应急水量调度，有力有效应对水旱灾害。

The MWR and local water resources departments at all levels implemented forcefully President Xi Jinping's instructions on flood prevention and drought relief. They upheld the people-centered approach and scientific prevention and control, and shifted the focus from disaster relief to comprehensive disaster prevention, from post-disaster response to pre-disaster preparedness, and from risk mitigation to hazard management. In compliance with the decisions and plans of the CPC Central Committee and the State Council, they focused on achieving the goals of “zero casualties, no dam breaches, no key embankment failures, and no disruption to vital infrastructure” as well as ensuring rural and urban water supplies. A multi-layered, comprehensive “three-line defense” for rainfall and hydrological monitoring and forecasting was further improved, comprising meteorological satellites, rain radars, rainfall stations, and hydrological stations; the four preemptive pillars of disaster prevention were further strengthened: forecasting, early warning, exercising, and contingency planning; and the effectiveness of the flood and drought disaster prevention system was fully leveraged, with active command and coordination mechanism for major flood and drought events, and coordinated emergency water dispatch and scheduling for water projects; as a result, responses to flood and drought disasters were robust and effective.

4.1 工作部署

年初，水利部组织召开全国水利工作会议和水旱灾害防御工作会议等，统筹部署水旱灾害防御、水库安全度汛、山洪灾害防御和蓄滞洪区建设管理等重点工作。指导逐流域召开流域防总工作会议，提前谋划部署水旱灾害风险防范各项任务。先后印发《关于做好2025年山洪灾害防御重点工作的通知》《关于做好2025年蓄滞洪区运用准备工作的通知》，部署推进山洪灾害隐患排查整治、监测预警体系完善、防御预案修订、临灾预警“叫应”、“五个关键环节”责任落实，以及蓄滞洪区责任压实、预案完善、隐患排查、基础信息更新等准备工作。

4.1 Work Deployment

At the beginning of the year, the MWR convened the National Water Resources Work Conference and working meetings on flood and drought disaster prevention and mitigation, among others, to coordinate and deploy key tasks such as flood and drought disaster prevention, reservoir safety during the flood season, flash flood prevention, and flood detention areas construction and management. Working meetings of Flood Control and Drought Relief Headquarters (hereinafter FDH) were held for each river basin to proactively address risks. *The Notice on Key Tasks for Flash Flood Disaster Prevention in 2025* and *the Notice on Preparing for the Operation of Flood Detention Areas in 2025* were issued, which deployed efforts to advance the identification and rectification of flash flood hazards, improve monitoring and early warning systems, the revision of prevention plans, clarify responsibilities regarding the “call-and-response” mechanism and “five key links” (monitoring, forecasting, early warning, operational dispatch, and evacuation and risk mitigation) and preparatory work regarding enhancing responsibilities for flood detention areas, the refinement of contingency plans, hazard identification, and the updating of basic information.

4.2 隐患排查

2025 年 4—5 月，水利部组织开展水旱灾害防御专项监督检查，部领导、总师带队组成 6 个检查组，赴黑龙江、山东、湖北、海南、重庆、甘肃 6 省（直辖市）实地督导汛前准备工作，重点检查水旱灾害防御体系、防洪“四预”措施、水库调度运用、工程安全度汛、山洪灾害防御、蓄滞洪区管理、抗旱供水保障等落实情况。对检查发现的 8 类问题，以“一省一单”形式反馈地方及工程管理部门，建立台账、限期整改，全力清零风险隐患。各地采取市、县全面自查，省级重点抽查与线上督导相结合的方式，对山洪灾害雨水情监测站网、预报预警平台、群测群防体系等开展全覆盖排查整治，确保汛期发挥作用。

4.2 Risk Identification

From April to May 2025, the MWR organized a special supervision and inspection campaign for flood and drought disaster prevention. Led by ministerial leaders and chiefs, six inspection teams were dispatched to Heilongjiang, Shandong, Hubei, Hainan, Chongqing, and Gansu to provide on-site guidance for pre-flood preparations. The inspections focused on the implementation of the prevention systems, the four preemptive pillars for flood control, reservoir operation and scheduling, engineering safety during the flood season, flash flood disaster prevention, management of flood detention areas, and water supply guarantee for drought relief. For the eight categories of issues identified during the inspections, case by case feedback was provided to local authorities and project management units in each province. Rectification inventories were established with binding timelines to ensure full elimination of risks and hazards. Localities adopted a combined approach of comprehensive self-inspections at the city/county levels and targeted spot checks and online supervision at the provincial level, to conduct full-coverage inspections and rectifications regarding the monitoring station networks, forecasting and early warning platforms, and community-based monitoring and prevention systems, ensuring their effective operation during the flood season.

4.3 汛前演练

针对近年洪水防御暴露出的问题，结合 2025 年汛情趋势预测，水利部充分利用数字孪生平台和 2024 年汛末以来开展的流域防洪“四预”能力提升建设成果，开展防洪调度演练，有效检验超标准洪水情景下雨水情监测预报、决策支持、调度指挥和突发事件应急处置、协调联动等能力。长江水利委员会（以下简称“长江委”）选取长江上游 1981 年型特大洪水，并适当放大，构建“81·7+”暴雨洪水进行模拟演练；黄河水利委员会（以下简称“黄委”）以黄河“82·8”洪水为原型，模拟三门峡至花园口区间发生大洪水过程并开展应对演练；淮河水利委员会（以下简称“淮委”）以 2024 年淮河第 1 号洪水为本底条件，叠加史灌河、淝河发生较大洪水进行模拟演练；海河水利委员会（以下简称“海委”）以漳河 2021 年 7 月暴雨洪水为原型，并将雨量、雨型按最不利情况放大后开展模拟演练；珠江水利委员会（以下简称“珠江委”）将韩江 2006 年 6 月和 2024 年 6 月洪水的降雨过程进行叠加组合，模拟极端暴雨洪水场景并开展应对演练；松辽水利委员会（以下简称“松辽委”）将 2023 年拉林河流域暴雨移植于洮儿河流域，模拟复杂环境、极限条件下的洪水过程并开展应对演练；太湖流域管理局（以下简称“太湖局”）以太湖流域现状工况遭遇 1999 年型设计降雨为背景，模拟上游洪水与下游暴雨洪水叠加极端情况下的洪水及应对过程。

4.3 Pre-flood Exercising

In response to issues exposed in recent flood prevention efforts and in light of the 2025 flood development forecast, the MWR took the following actions: it fully leveraged the digital twin platform and the achievements of enhancing basin-wide four preemptive capacity launched since the end of the 2024 flood season to conduct command and scheduling exercises. These exercises effectively tested capabilities, under beyond-standard flood scenarios, in rainfall and hydrological monitoring and forecasting, decision support, dispatch and command, emergency response, and cooperation and coordination. The Changjiang Water Resources Commission (hereinafter “the Changjiang Commission”) selected the scenario of the 1981 extreme flood in the upper Yangtze and moderately amplified it to construct a “81·7+” rainstorm



flood simulation scenario. The Yellow River Conservancy Commission (hereinafter “the Yellow River Commission”) used the Yellow River “82·8” flood as a prototype to simulate a large flood process in the Sanmenxia to Huayuankou section and conducted response exercises. The Huaihe River Commission (hereinafter “the Huaihe Commission”) used the 2024 Huaihe No. 1 flood as the baseline condition and combined with medium floods on the Shiguan River and Pihe River to conduct simulation exercises. The Haihe River Water Conservancy Commission (hereinafter “the Haihe Commission”) used the July 2021 rainstorm and floods on the Zhanghe River as a prototype, and conducted simulation exercises after amplifying rainfall amounts and patterns to the most adverse conditions. The Pearl River Water Resources Commission (hereinafter “the Pearl River Commission”) combined the rainfall processes of the June 2006 and June 2024 floods on the Hanjiang River to simulate an extreme rainstorm flood scenario and conducted response exercises. The Songliao Water Resources Commission (hereinafter “the Songliao Commission”) transplanted the 2023 rainstorm event scenario in the Lalin River basin to the Tao’er River basin to simulate flood processes under complex environments and extreme conditions and conducted response exercises. The Taihu Basin Authority (hereinafter “the Taihu Authority”) simulated flood processes and responses against the extreme superposition of upstream floods and downstream rainstorms, using the scenario of the Taihu Basin encountering the 1999-type design rainfall under current operational conditions.

4.4 “四预”措施

水利部及地方各级水利部门充分利用“天空地水工”一体化监测感知系统，强化预报、预警、预演、预案“四预”措施，汛期滚动发布水情预报 110.42 万站次、江河洪水预警 2271 次，其中水利部流域管理机构发布洪水预报 1360 期、洪水预警 55 站次。水利部联合中国气象局发布未来 24 小时山洪灾害气象风险预警 173 期，滚动发布未来 2 小时山洪灾害临近预报预警 2599 期，发布山洪灾害风险区域及点位“一省一单”靶向预警 1025 省次、11915 县次，累计抽查县级山洪灾害监测预警情况 1382 县次。北京等 29 省（自治区、直辖市）和新疆生产建设兵团累计发布山洪灾害预警 31.68 万次，通过山洪灾害监测预警平台向防汛责任人发送预警短信 7048.37 万条、启动预警广播 6.03 万次，依托“三大运营商”向社会公众发布预警短信 21.38 亿条，提前转移 286.6 万人次。充分运用全国 1734 个江河湖库旱警水位（流量）站点，累计发布干旱预警 136 次。

长江委整合 86 部天气雷达和 9 部水利测雨雷达以及 5 万余处监测站点数据，完善数字孪生长江智慧防洪抗旱系统澧水、汉江“四预”平台，动态模拟预演骨干工程调度和洪水演进，比选最优调度方案，成功应对梅雨期澧水上游 1998 年以来最大洪水、夏汛期汉江流域极端枯水和秋汛期汉江 7 次编号洪水。

黄委推进“三条黄河”（原型黄河、模型黄河、数字孪生黄河）耦合联动与防洪“四预”建设，完成伊洛河、大汶河试点，实现洪水全链条在线计算，有效应对黄河及渭河编号洪水。

淮委完成史灌河、淠河“四预”能力提升建设，推进数字孪生淮河“四预”系统完善，发布气象水文预报 265 期、干旱预警 6 次，有效应对流域汛情旱情。

海委完成漳河和大清河中下游防洪“四预”能力提升，接入 19 部天气雷达与 13 部测雨雷达，滚动开展洪水预报，有效防御“25·7”暴雨洪水，避免 2 处蓄滞洪区启用，保障雄安新区等重点区域安全。

珠江委完成北江、汀江防洪“四预”能力提升，建立预报调度一体化模型，具备 30 秒生成单站预报、1 分钟完成全流域调度方案能力，编制 145 条中小河流预报方案，发布预警 354 万余条，有效防御郁江 2001 年以来最大洪水。

松辽委完成洮儿河和松花江支流梧桐河防洪“四预”能力提升建设，修编 24 个河道站预报方案，推动西辽河干流两次全线过流，有效应对鸭绿江等洪水。

太湖局完成太浦河防洪“四预”能力提升，会同浙江省、安徽省完成钱塘江防洪“四预”能力提升，依托太湖流域多目标统筹“四预”一体化系统开展预演 246 次，有效应对 1 次太湖编号洪水及 7 个台风。

4.4 The Four Preemptive Pillars

The MWR and local water resources departments took advantage of the integrated “space-air-ground-water-project” monitoring and sensing system and strengthened the four preemptive pillars (forecasting, early warning, exercising, and contingency planning). A total of 1,104,200 station-times of hydrological forecasts and 2,271 times of river flood warnings were released in a non-stop manner during the flood season. Among these, basin authorities under the MWR issued 1,360 flood forecasts and 55 flood warnings. The MWR issued 173 meteorological warnings for flash flood disasters over the next 24 hours in collaboration with the China Meteorological Administration, issued 2,599 alerts for imminent flash floods over the next two hours, issued targeted alerts for flash flood-prone areas and specific locations under “one list per one province” totaling 1,025 times at provincial level and 11,915 times at county level, and conducted spot checks on county-level flash flood monitoring and early warning systems for 1,382 times. A total of 316,800 early warnings were issued across 29 provinces/autonomous regions/municipalities, including Beijing, and the Xinjiang Production and Construction Corps. Through the flash flood monitoring and early warning platform, 70.4837 million text alerts were sent to responsible officials for flood control, 60,300 broadcasts were announced, 2.138 billion text alerts were sent to the public via the three major telecom operators, and 2.866 million person-times were preemptively evacuated. By fully utilizing 1,734 drought early warning water level/flow monitoring stations across rivers, lakes, and reservoirs nationwide, a total of 136 drought alerts were issued.

The Changjiang Commission integrated data from 86 weather radars, 9 hydrological rain radars, and more than 50,000 monitoring stations to enhance the four-preemptive-pillar platform for the Lishui and Hanjiang rivers within the Digital Twin Yangtze River Smart Flood Control and Drought Relief System. It dynamically simulated and rehearsed the dispatch of key projects and flood process development, identified the optimal dispatch plans, and successfully responded to the largest flood in the upper Lishui River since 1998 during the plum rain season, the extreme low waters in the Hanjiang River basin during the summer flood season, and seven numbered floods in the Hanjiang River during the autumn flood season.

The Yellow River Commission advanced the coupling of the “Three Yellow Rivers” (prototype, modeled, and digital twin) and the development of the four preemptive pillars. It completed pilot projects on the Yiluo and Dawen rivers, achieved full-chain online flood calculation, and effectively responded to numbered floods on the Yellow River and Weihe River.

The Huaihe Commission enhanced the four preemptive capabilities for the Shiguan and Pihe rivers, refined the digital twin for the Huaihe River for better preemptive capabilities, issued 265 meteorological and hydrological forecasts and 6 drought early warnings, and effectively responded to flood and droughts in the basin.

The Haihe Commission enhanced the four preemptive capabilities for flood control on the middle and lower reaches of the Zhanghe and Daqing rivers, integrated 19 weather radars and 13 rain radars, conducted rolling flood forecasts, and effectively defended against the “July 2025” rainstorm and floods, avoided the activation of two flood detention areas, and ensured the safety of key areas such as the Xiong’an New Area.

The Pearl River Commission enhanced the four preemptive capabilities for flood control on the Beijiang and Tingjiang rivers, established an integrated forecasting and dispatch model capable of generating single-station forecasts within 30 seconds and completing basin-wide dispatch plans within one minute. It developed forecasting plans for 145 small and medium-sized rivers and issued over 3.54 million early warnings, effectively defending against the largest flood on the Yujiang River since 2001.

The Songliao Commission enhanced the four preemptive capabilities for flood control on the Tao’er River and Wutong River (a tributary of the Songhua River), revised forecast plans for 24 river stations, facilitated two instances of full-line flow on the Xiliao mainstream, and effectively responded to floods on the Yalu River.

The Taihu Authority enhanced the four preemptive capabilities for flood control on the Taipu River and, in collaboration with Zhejiang and Anhui provinces, also improved such capabilities for the Qiantang River. Relying on the Taihu multi-objective integrated four-preemptive-pillar system, it conducted 246 simulation exercises, effectively responding to one numbered flood in Taihu Lake and 7 typhoons.

表 4-1 2025 年汛期水利部流域管理机构预报预警情况

Table 4-1 Forecasting and early warning activities by each river basin commission/authority during the 2025 flood season

流域管理机构 Commission/ authority	降雨预报 / Rainfall forecasts/ time	洪水预报 / 期 Flood forecasts/ time	洪水预警 / 站次 Flood warnings/ station-time	预警短信 / 万条 Alert messages/ 10,000 pieces
长江委 Changjiang	394	264	25	6.50
黄委 Yellow River	161	330	5	7.09
淮委 Huaihe	188	77	2	0.30
海委 Haihe	145	61	5	10.97
珠江委 Pearl River	214	347	15	7.20
松辽委 Songliao	20	96	2	1.40
太湖局 Taihu	49	185	1	1.20
合计 Total	1171	1360	55	34.66

注 太湖局降雨预报数据来源于中国气象局华东区域气象中心。

Note Rainfall forecast data for Taihu is sourced from the East China Regional Meteorological Center of the China Meteorological Administration.

4.5 会商响应

水利部强化落实水旱灾害风险研判、预警、防范和处置等各项措施，坚持主汛期部长“周会商 + 场次洪水会商”机制，国家防总副总指挥、水利部部长李国英在防汛抗旱关键节点主持会商 19 次，率队赴北京、内蒙古、湖南等地检查防汛备汛、研判现场形势、调度水利工程和抢险力量；抗旱关键时刻 3 次主持专题会商部署西南及北方冬小麦主产区春旱应对、南水北调中线供水安全保障等工作。王宝恩副部长主持会商 52 次，坐镇指挥、滚动部署各项重点防御工作。水利部启动洪水防御Ⅲ级应急响应 4 次、Ⅳ级应急响应 31 次，启动干旱防御Ⅳ级应急响应 5 次。汛期每天以“一省一单”形式将预报日降雨量超过预警阈值（50 毫米或 25 毫米）的县（市、区）、水库名单和山洪灾害风险县（市、区）发至相关省级水利部门，提醒做好强降雨防范。

4.5 Consultation and Responses

The MWR strengthened the implementation of various measures regarding the assessment, early warning, prevention, and response to flood and drought disasters. It has maintained regular weekly consultation and consultation on specific flood events during the main flood season. Li Guoying, SFDH Vice Commander-in-Chief and Minister of Water Resources, presided over over 19 consultations at critical junctures. He led teams to Beijing, Nei Mongol, and Hunan to inspect preparations, assess on-site conditions, and coordinate project scheduling and emergency response forces. During the heights of drought relief work, he presided over three special consultations to address spring droughts in the main winter wheat-growth areas in Southwest and Northern China, as well as ensuring the security of water supply for the Middle Route of the South-to-North Water Diversion Project. Vice Minister Wang Baoen presided over 52 consultations, commanding operations and deploying key tasks. The MWR activated 4 Level III emergency responses and 31 Level IV emergency responses for flood control, and 5 Level IV emergency responses for drought relief. During the flood season, the Ministry issued daily “one list by one province” early warning notifications to relevant provincial authorities, detailing the administrative regions and reservoirs where forecast daily rainfall amounts exceeded early warning thresholds (50 mm or 25 mm), as well as counties/cities/districts at risk of flash floods.

表 4-2 2025 年水利部本级洪水防御应急响应启动情况
Table 4-2 Initiation of flood disaster prevention emergency responses by the Ministry of Water Resources in 2025

序号 No.	启动日期 Start date	响应级别 Response level	针对区域 Targeted area	终止日期 End date
1	3 月 13 日 March 13	IV	内蒙古 Nei Mongol	3 月 19 日 March 19
2	6 月 11 日 June 11	IV	福建、江西、湖南、广东、广西、海南 Fujian, Jiangxi, Hunan, Guangdong, Guangxi, Hainan	福建、江西、湖南、广西、海南 6 月 17 日, 广东 6 月 19 日 Fujian, Jiangxi, Hunan, Guangxi, Hainan on June 17; Guangdong on June 19
3	6 月 14 日 June 14	IV	浙江 Zhejiang	6 月 17 日 June 17
4	6 月 19 日 June 19	IV	江苏、浙江、安徽、河南、湖北、湖南、广西、重庆、贵州 Jiangsu, Zhejiang, Anhui, Henan, Hubei, Hunan, Guangxi, Chongqing, Guizhou	江苏、河南、重庆 6 月 22 日, 浙江、安徽 6 月 26 日, 湖北、湖南、广西、贵州 6 月 27 日 Jiangsu, Henan, Chongqing on June 22; Zhejiang, Anhui on June 26; Hubei, Hunan, Guangxi, Guizhou on June 27
5	6 月 29 日 June 29	IV	重庆、四川、甘肃 Chongqing, Sichuan, Gansu	甘肃 7 月 9 日, 重庆、四川 7 月 12 日 Gansu on July 9; Chongqing, Sichuan on July 12
6	7 月 3 日 July 3	IV	青海 Qinghai	7 月 9 日 July 9
7	7 月 7 日 July 7	IV	浙江、福建 Zhejiang, Fujian	7 月 12 日 July 12
8	7 月 9 日 July 9	IV	广东 Guangdong	7 月 12 日 July 12
9	7 月 19 日 July 19	IV	广东、广西、海南 Guangdong, Guangxi, Hainan	7 月 24 日 July 24
10	7 月 24 日 July 24	IV	河北、山西、内蒙古、陕西 Hebei, Shanxi, Nei Mongol, Shaanxi	山西、陕西 7 月 30 日, 内蒙古 7 月 27 日提升至Ⅲ级, 河北 7 月 28 日提升至Ⅲ级 Shanxi, Shaanxi on July 30; Nei Mongol elevated to Level Ⅲ on July 27; Hebei elevated to Level Ⅲ on July 28
11	7 月 25 日 July 25	IV	浙江、福建 Zhejiang, Fujian	福建 7 月 30 日, 浙江 8 月 1 日 Fujian on July 30; Zhejiang on August 1
12	7 月 27 日 July 27	III	内蒙古 Nei Mongol	9 月 2 日 September 2
13	7 月 27 日 July 27	IV	北京 Beijing	7 月 28 日提升至Ⅲ级 Elevated to Level Ⅲ on July 28
14	7 月 28 日 July 28	IV	上海、江苏、安徽、江西 Shanghai, Jiangsu, Anhui, Jiangxi	上海、江西 8 月 1 日, 江苏、安徽 8 月 13 日 Shanghai, Jiangxi on August 1; Jiangsu, Anhui on August 13
15	7 月 28 日 July 28	IV	新疆 Xinjiang	8 月 13 日 August 13
16	7 月 28 日 July 28	III	北京、河北 Beijing, Hebei	8 月 1 日调整至Ⅳ级, 河北 8 月 11 日终止, 北京 8 月 23 日终止 Adjusted to Level IV on August 1; and Hebei on August 11 while Beijing on August 23
17	8 月 3 日 August 3	IV	甘肃、青海、宁夏 Gansu, Qinghai, Ningxia	宁夏 8 月 11 日, 甘肃、青海 8 月 3 日提升至Ⅲ级 Ningxia on August 11, Gansu and Qinghai elevated to Level Ⅲ on August 3

续表 Continued

序号 No.	启动日期 Start date	响应级别 Response level	针对区域 Targeted area	终止日期 End date
18	8月3日 August 3	III	甘肃、青海 Gansu, Qinghai	8月5日调整至IV级, 青海8月11日终止, 甘肃8月13日终止 Adjusted to Level IV on August 5; and Qinghai on August 11 while Gansu on August 13
19	8月4日 August 4	IV	广东、广西 Guangdong, Guangxi	8月9日 August 9
20	8月4日 August 4	IV	天津 Tianjin	8月9日 August 9
21	8月9日 August 9	IV	河南、湖北、重庆、四川、陕西 Henan, Hubei, Chongqing, Sichuan, Shaanxi	河南、陕西8月13日, 湖北、重庆8月17日, 四川9月11日 Henan and Shaanxi on August 13; Hubei and Chongqing on August 17; Sichuan on September 11
22	8月13日 August 13	IV	福建、广东、广西、湖南 Fujian, Guangdong, Guangxi, Hunan	福建、湖南8月17日, 广东8月20日, 广西8月23日 Fujian and Hunan on August 17; Guangdong on August 20; Guangxi on August 23
23	8月14日 August 14	IV	贵州 Guizhou	8月30日 August 30
24	8月17日 August 17	IV	海南 Hainan	8月20日 August 20
25	8月19日 August 19	IV	天津、河北、辽宁、云南 Tianjin, Hebei, Liaoning, Yunnan	天津、河北8月23日, 云南8月30日, 辽宁9月3日 Tianjin and Hebei on August 23; Yunnan on August 30; Liaoning on September 3
26	8月24日 August 24	IV	广东、广西、海南 Guangdong, Guangxi, Hainan	8月27日 August 27
27	8月26日 August 26	IV	北京、天津、河北 Beijing, Tianjin, Hebei	8月29日 August 29
28	9月3日 September 3	IV	陕西 Shaanxi	9月11日 September 11
29	9月7日 September 7	IV	广东、广西 Guangdong, Guangxi	9月11日 September 11
30	9月18日 September 18	IV	湖北、重庆、四川、陕西 Hubei, Chongqing, Sichuan, Shaanxi	湖北9月21日, 重庆、四川、陕西9月22日 Hubei on September 21; Chongqing, Sichuan, and Shaanxi on September 22
31	9月18日 September 18	IV	福建、广东 Fujian, Guangdong	福建9月21日, 广东9月23日提升至Ⅲ级 Fujian on September 21; Guangdong elevated to Level III on September 23
32	9月23日 September 23	IV	福建、广西、海南 Fujian, Guangxi, Hainan	福建9月26日, 广西、海南9月30日 Fujian on September 26; Guangxi and Hainan on September 30
33	9月23日 September 23	III	广东 Guangdong	9月26日 September 26
34	10月4日 October 4	IV	广东、广西、海南、云南 Guangdong, Guangxi, Hainan, Yunnan	广东、海南10月7日, 广西、云南10月13日 Guangdong and Hainan on October 7; Guangxi and Yunnan on October 13
35	10月12日 October 12	IV	山西、河南、陕西 Shanxi, Henan, Shaanxi	10月17日 October 17

表 4-3 2025 年水利部本级干旱防御应急响应启动情况

Table 4-3 Initiation of drought relief emergency responses by the Ministry of Water Resources in 2025

序号 No.	启动日期 Start date	响应级别 Response level	针对区域 Targeted area	终止日期 End date
1	4 月 21 日 April 21	IV	广西、陕西 Guangxi, Shaanxi	广西 5 月 14 日, 陕西 6 月 6 日 Guangxi on May 14; Shaanxi on June 6
2	4 月 24 日 April 24	IV	山西、云南 Shanxi, Yunnan	5 月 27 日 May 27
3	5 月 15 日 May 15	IV	甘肃 Gansu	6 月 6 日 June 6
4	5 月 19 日 May 19	IV	湖北、四川 Hubei, Sichuan	6 月 6 日 June 6
5	5 月 21 日 May 21	IV	宁夏 Ningxia	6 月 6 日 June 6

表 4-4 2025 年各流域管理机构会商及洪水防御应急响应启动情况

Table 4-4 Consultations held and emergency responses initiated by river basin commissions/ authorities for flood disaster prevention in 2025

流域管理机构 Commission / authority	会商次数 Consultations	应急响应启动次数 Emergency responses				累计时间 / 天 Total duration/ days
		I 级 Level I	II 级 Level II	III 级 Level III	IV 级 Level IV	
长江委 Changjiang	172				6	47
黄委 Yellow River	99			3	25	74
淮委 Huaihe	51				3	10
海委 Haihe	139			1	3	35
珠江委 Pearl River	149		1	8	16	110
松辽委 Songliao	34				3	28
太湖局 Taihu	176			1	7	37
合计 Total	820		1	13	63	341

注 | 空白表示未启动。

Note | Blanks indicate zero initiation of such responses.

4.6 工程调度

强化水工程统一调度、联合调度、精准调度，依托数字流场模拟系统，“正向—逆向—正向”预演水工程运用次序、时机和规模，迭代优化防御预案，充分发挥流域防洪抗旱减灾工程体系综合减灾效益。各级水利部门共下达调度指令 2.21 万道，6894 座次大中型水库投入防洪调度运用，拦洪 1201.63 亿立方米；长江、黄河、珠江等流域机构多次实施水库群联合抗旱补水调度，精准对接旱区城乡供水和灌区取水。

4.6 Water Project Scheduling

The unified, coordinated, and precise scheduling of water engineering projects was realized. Leveraging digital flow field simulation systems, the “forward-reverse-forward” simulations were conducted to test the sequence, timing, and scale of project scheduling, and prevention plans were optimized to fully harness the comprehensive disaster-reduction benefits of the basin-wide flood control, drought relief, and disaster mitigation engineering system. Water resources departments at different levels issued a total of 22,100 scheduling dispatches. Large and medium-sized reservoirs were deployed for flood control operations and held back 120.163 billion m³ of floodwater under 6,894 dispatch orders. Basin management agencies for the Yangtze River, Yellow River, and Pearl River implemented multiple joint drought-relief operations by diverting water from reservoir groups, providing for urban and rural drinking water and irrigation water in irrigation districts in the drought-stricken regions.

长江流域: 5月至8月中旬,水利部组织实施汉江上游19座水库统一联合补水调度,逐步压减丹江口水库下泄及清泉沟、陶岔渠首供水流量,择机调减河北、河南两省南水北调中线取水流量,在极端枯水形势下持续保障南水北调中线一期工程正常供水,确保北京、天津、河北、河南四省(直辖市)相关地区供水安全和上海合作组织天津峰会期间的天津市生态用水需求。调度三峡水库7—8月加大下泄流量,支撑引江济汉工程引水,以长江干流水源替换丹江口水库下泄水量;调度鸭河口、三里坪等支流水库为下游补水,确保湖北钟祥、仙桃等地供水安全。统筹考虑流域内外用水需求,调度引汉济渭工程持续向西安市跨流域调水,有力支持西安市渡过缺水难关。8月20日至10月18日,联合调度汉江上游控制性水库群提前腾库、全面拦洪和削峰,最大限度地降低汉江中下游水位,汉江上游水库群累计拦洪174亿立方米,实现汉江中下游错峰行洪,避免了皇庄江段水位超警戒、仙桃至汉川江段水位超保证,以及杜家台蓄滞洪区和中下游分蓄洪民垸的启用,极大地减轻汉江中下游地区防洪压力,有效保障人民群众生命财产安全和流域防洪安全。春灌期间,以三峡水库为核心的长江上游水库群实施3次补水调度,累计补水72亿立方米,保障湖北荆州、武汉等沿江城市和中下游3705.33千公顷农田灌溉用水。结合三峡水库春灌补水调度,人工塑造“洪水”,开展2次库尾减淤调度,三峡库尾江段冲刷泥沙195万立方米,恢复防洪库容147万立方米。结合水库群消落和汛期来水过程,开展水工程生态调度21次,首次开展大渡河梯级生态调度试验、三峡水库下游中华鲟自然产卵生态调度试验,三峡2次促进坝下产漂流性卵鱼类生态调度试验期间,监利江段鱼苗总规模超千亿尾,再创新高。

Yangtze River Basin: From May to mid-August, the MWR organized and implemented unified joint water replenishment operations across 19 reservoirs in the upper Hanjiang River. This involved gradually reducing the outflow from the Danjiangkou Reservoir and the flow supplied to Qingquangou and Taocha canal headworks, while seizing the timing to reduce the water withdrawal by Hebei and Henan provinces from the Middle Route of the South-to-North Water Diversion Project. Despite extreme low water conditions, the joint scheduling ensured the continued normal water supply along the Middle Route Phase I project of the South-to-North Water Diversion Project, guaranteeing water security for relevant areas in Beijing, Tianjin, Hebei, and Henan as well as providing for ecological water needs in Tianjin city when it was hosting the Shanghai Cooperation Organization Tianjin Summit. The Three Gorges Reservoir was scheduled to increase outflow in July and August to support water diversion via the Yangtze-to-Hanjiang Project, replacing the water sourcing from the Danjiangkou Reservoir to the Yangtze mainstream; tributary reservoirs such as Yahekou and Sanliping were scheduled to replenish water downstream, ensuring water supply security in areas such

as Zhongxiang and Xiantao in Hubei. Taking into account water demands both within and outside the basin, the Hanjiang-to-Weihe Water Diversion Project was scheduled to sustain water supply to Xi'an city outside the basin area, supporting the city to overcome its water shortage crisis. From August 20 to October 18, a coordinated operation of the control reservoir group on the upper Hanjiang was implemented to preemptively empty storage, maximize floodwater retention and reduce peak flows, thereby restricting water levels in the middle and lower reaches of the Hanjiang to the maximum possible extent. The reservoir group on the upper Hanjiang retained in total 17.4 billion m^3 of floodwater, allowing for flood discharge in the middle and lower reaches of the Hanjiang at different timing. This also prevented the Huangzhuang river section from exceeding the warning level, the Xian'tao-Hanchuan river section from exceeding the guaranteed level, and the Dujiatai flood detention area and the flood detention polders in the middle and lower reaches from being activated. This significantly alleviated flood control pressure in the middle and lower reaches of the Hanjiang, effectively protected public lives and property, and ensured flood safety in the basin. During the spring irrigation period, the reservoir group on the upstream Yangtze, with the Three Gorges Reservoir as the key, carried out three water replenishment operations to supply a total of 7.2 billion m^3 of water. This ensured irrigation water for riverside cities such as Jingzhou and Wuhan in Hubei Province, as well as for 3.7053 million ha of farmland in the middle and lower reaches. In conjunction with the scheduling operations at the Three Gorges Reservoir for spring irrigation, artificial flood pulses were created to conduct two de-siltation operations at the reservoir tail. A total of 1.95 million m^3 of sediment was flushed downstream of the Three Gorges Reservoir, restoring 1.47 million m^3 of flood control storage capacity. Taking advantage of the reservoir group's drawdown and floodwater flow processes, 21 engineering operations were conducted for ecological purposes. For the first time, eco-oriented operation trials were carried out on the Dadu River cascade and for the natural spawning of Chinese sturgeon in the downstream area of the Three Gorges Reservoir. During the two eco-oriented operation trials at the Three Gorges Reservoir to promote the spawning of drift-spawning fish species downstream of the dam, the total number of fish fry in the Jianli section exceeded 100 billion, setting a new record.

黄河流域：应对黄河第 1 号洪水过程中，水利部和黄河流域有关省水利部门调度三门峡水库按 6500 立方米每秒下泄直至敞泄，适时调整小浪底水库下泄流量，控制花园口站不超 3000 立方米每秒，同时兼顾洪水资源利用，陆浑、故县、河口村等水库按照不超过征地水位或正常蓄水位控泄。实施主汛期前及汛期两次调水调沙，实现抗旱保供、腾库迎汛、水库排沙、生态补水等多目标共赢。春灌期间调度黄河刘家峡、小浪底等骨干水库向下游补水，累计补水 92 亿立方米，增加山东、陕西、甘肃三省应急抗旱用水，为夏粮稳产丰收贡献了水利力量。夏伏旱期间调度小浪底水库下泄流量从 2600 立方米每秒逐步加大至 4600 立方米每秒，指导山东、河南、河北等省利用黄河流量增大的时机实施抗旱引水，有力地支撑抗旱保灌。

Yellow River Basin: In response to 2025 No.1 flood of the Yellow River, the MWR and relevant water resources departments at provincial level directed the Sanmenxia Reservoir to discharge at a rate of 6,500 m³/s and then reach free discharge with all gates opened, and timely adjusted the outflow of the Xiaolangdi Reservoir to keep the flow at Huayuankou station below 3,000 m³/s; meanwhile, to enhance utilization of floodwater resources, reservoirs such as Luhun, Guxian, and Hekoucun were under release mode as long as the water levels didn't go beyond their design water levels of land expropriation or normal storage levels. Two water and sediment regulation operations were carried out—one before the main flood season and one during the flood season—and achieved multiple objectives, including water supply for drought relief, emptying reservoir storage for floodwater retention, reservoir sediment flushing, and ecological water replenishment. During the spring irrigation season, critical reservoirs on the Yellow River such as Liujiaxia and Xiaolangdi were scheduled to replenish downstream a total of 9.2 billion m³. This increased emergency water supplies for Shandong, Shaanxi, and Gansu provinces and contributed to ensuring a stable summer grain harvest. During the mid-summer drought, the outflow from the Xiaolangdi Reservoir was gradually increased from 2,600 m³/s to 4,600 m³/s. Guidance was provided to Shandong, Henan, and Hebei provinces to utilize the increased flow for drought relief, effectively combating drought and supporting irrigation.

淮河流域: 9 月至 11 月下旬多轮降雨洪水过程期间，水利部和淮河流域有关省水利部门调度蚌埠闸大流量泄洪超过 2 个月，有效地保障淮河干支流洪水平稳入洪泽湖，同期开启三河闸，利用入江水道大流量泄洪，累计下泄水量约 85 亿立方米。7 月阶段性旱情期间，加大部分大型水库下泄流量，利用东平湖南排工程分泄洪水和南水北调东线一期工程满负荷抽水，及时补充南四湖抗旱水源，有效地保障周边地区供水安全、农田灌溉需求以及京杭大运河通航安全，避免南四湖等重要湖泊的生态危机。

Huaihe River Basin: During multiple rounds of rainfall and floods from September to late November, the MWR and relevant water resources departments at provincial level worked together to maintain large-volume discharge from the Bengbu Sluice for over two months, ensuring that floodwaters from the mainstream and tributaries of the Huaihe entered steadily into Hongze Lake. Concurrently, the Sanhe Sluice was opened to discharge approximately 8.5 billion m³ of water to the Yangtze River. When temporary drought conditions hit in July, the outflow from certain large reservoirs was increased, the Dongping Lake South Discharge Project was utilized to divert floodwaters, and the East Route Phase I project of the South-to-North Water Diversion Project operated at full capacity to draw water from the Yangtze River. This timely replenished water sources for drought relief in the Nansi Lakes, ensuring water supply for surrounding areas, meeting agricultural irrigation needs, safeguarding navigation safety on the Beijing-Hangzhou Grand Canal, and averting ecological deterioration in important lakes such as the Nansi Lakes.

海河流域：水利部和海河流域有关省（直辖市）水利部门精准调度防洪工程体系，流域内 82 座大中型水库累计拦洪 24.62 亿立方米，确保北京、天津、雄安新区等重点地区和南水北调工程等重要基础设施安全，成功化解了“25·7”区域性大洪水风险。针对北三河大洪水，实施北运河－潮白河－蓟运河系统调度。密云水库发挥关键拦蓄作用，削峰率达 99%，洪峰过后逐级稳步加大泄量至 1120 立方米每秒，水库水位安全有序下降。调度上游怀柔、北台上、大水峪等 7 座水库充分拦蓄，压减下泄流量共计 290 立方米每秒，优化调度北运河北关枢纽，充分利用北运河下泄洪水，减轻潮白河行洪压力，成功避免黄庄洼蓄滞洪区启用。开展北京海子、黄松峪、西峪水库和天津杨庄水库联合调度，全力压减下泄流量，保障沟河河北三河市区段河道安全行洪。科学调度大清河北支新盖房枢纽分泄洪水，2 次避免东淀蓄滞洪区启用；调度大清河南支王快、龙门等 5 座大型水库全力拦洪削峰，白洋淀最高水位控制在 7.17 米，有力地保障雄安新区防洪安全。

Haihe River Basin: The MWR and relevant water resources departments at provincial level coordinated the flood control engineering system in a precise manner. A total of 82 large and medium-sized reservoirs in the basin retained 2.462 billion m^3 of floodwater, ensuring the safety of key areas such as Beijing, Tianjin, and the Xiong'an New Area, as well as critical infrastructure like the South-to-North Water Diversion Project, and successfully mitigating the risk of the “July 2025” regional large flood. In response to the large flood in the Beisan rivers, systematic dispatch was implemented across the Beiyun River-Chaobai River-Jiyun River system. The Miyun Reservoir played a critical role in flood retention, shaving the peak flow by 99%. After the flood peak passed, discharge was gradually increased to 1,120 m^3/s , allowing the reservoir water level to drop safely and gradually. Seven upstream reservoirs, including Huairou, Beitaishang, and Dashuiyu, were fully utilized for flood retention, reducing the outflow by 290 m^3/s . The Beiyun River Beiguan complex was scheduled to fully utilize the floodwater from the Beiyun River and alleviate flood pressure on the Chaobai River, thereby preventing the activation of the Huangzhuangwa flood detention area. Joint operations were conducted at Haizi, Huangsongyu, and Xiyu reservoirs in Beijing and Yangzhuang Reservoir in Tianjin to reduce the flow downstream and ensure safe flood passage along the Sanhe urban section of the Juhe River in Hebei Province. The Xingtaifang complex on the north branch of the Daqing River worked to divert floodwaters and prevented the activation of the Dongdian flood detention area on two occasions; five large reservoirs on the south branch of the Daqing River—including Wangkuai and Longmen—were operated to fully retain floodwaters and reduce peak flows, keeping the maximum water level in Baiyangdian Lake at 7.17 m and ensuring flood safety in the Xiong'an New Area.

珠江流域：应对台风“桦加沙”“博罗依”“麦德姆”暴雨洪水过程中，水利部和珠江流域有关省（自治区）水利部门调度右江水库群 13 座骨干水库拦洪 34.3 亿立方米，百色水库运用至 228.00 米防洪高水位，成功防御郁江 2001 年以来最大洪水，确保南宁市、百色市城区等重要保护对象防洪安全。珠江枯水期调度天生桥一级、龙滩、大藤峡等流域骨干水库实施 5 轮“压咸补淡”应急水量调度，共补水 34 亿立方米，为珠海等地抢淡蓄水创造有利条件，累计向澳门、珠海提供优质淡水 1.5 亿立方米，连续 21 年确保粤港澳大湾区城市供水安全。针对 1—4 月西江梧州站、北江石角站天然来水分别为 1950 年有实测记录以来同期第 1 少、第 3 少的情况，实施精细调度，确保西江干流生态流量全年达标。

Pearl River Basin: In response to the rainstorms and floods caused by typhoons Ragasa, Bualoi, and Matmo, the MWR and relevant water resources departments at provincial level coordinated the operation of 13 critical reservoirs belonging to the Youjiang reservoir group to intercept 3.43 billion m^3 of floodwater; the Baise Reservoir was impounded up to 228.00 m—the higher-end of its flood control water level range—and successfully coped with the largest flood on the Yujiang River since 2001 and ensured flood safety for key protected areas such as the urban districts of Nanning and Baise. During the low-water period of the Pearl River, critical reservoirs—including Tianshengqiao I, Longtan, and Datengxia—were operated through five rounds of freshwater replenishment to prevent saltwater intrusion, replenishing a total of 3.4 billion m^3 . This created favorable conditions for freshwater collection and storage in places like Zhuhai, enabled high-quality freshwater supply to Macao and Zhuhai totaling 150 million m^3 , and ensured water supply security in the Guangdong-Hong Kong-Macao Greater Bay Area for 21 years in a row. In response to the fact that natural inflows at the Wuzhou Station on the Xijiang River and the Shijiao Station on the Beijiang River from January to April were the lowest and third-lowest in post-1950 history, respectively, refined scheduling was implemented to ensure required ecological flows in the Xijiang mainstream throughout the year.



松辽流域：水利部和松辽流域有关省（自治区）水利部门挖掘“主动防御空间”，优化调整水库汛期防洪调度策略。在保证供水安全的前提下，主汛期前，流域 23 座纳入统一联合调度的水库在汛限水位以下多预留 100 亿立方米库容，其中尼尔基、察尔森、丰满、白山 4 座直调水库多预留 52 亿立方米库容，以应对可能发生的洪水。滚动开展预报降雨落区内水库调洪演算 620 余次，科学指导龙凤山、云峰、桓仁等水库预泄腾库、拦洪削峰，有效减轻下游防洪压力。

Songhua-Liaohe River Basin: The MWR and relevant water resources departments at provincial level worked to identify proactive defense space and optimized flood control scheduling strategies for reservoirs during the flood season. While ensuring water supply security, 23 reservoirs in the basin subject to unified joint scheduling reserved an additional 10 billion m^3 of storage capacity below the flood control limit prior to the main flood season. Among them, the four directly managed reservoirs—Nierji, Charsen, Fengman, and Baishan—reserved an additional 5.2 billion m^3 of storage capacity in preparation for potential floods. More than 620 flood control simulation calculations were conducted on a rolling basis for reservoirs within forecast rainfall areas, providing scientific guidance for reservoirs such as Longfengshan, Yunfeng, and Huanren to pre-release water, create storage capacity, and intercept floods to reduce peak flows, effectively alleviating flood control pressure downstream.

太湖流域：第 8 号台风“竹节草”强降雨影响前，水利部和太湖流域有关省（直辖市）水利部门调度沿杭州湾南排、沿长江北排工程预降水位；台风强降雨影响期间，充分发挥太湖调蓄作用，为下游排涝创造条件，望虞河、太浦河排太湖水 2.6 亿立方米，通过沿长江、沿海、沿杭州湾口门排水 25.7 亿立方米，其间太湖最高水位 3.90 米，高于警戒水位 0.10 米，流域汛情总体平稳。两次实施望虞河引江济太调水，通过望虞河常熟水利枢纽引长江水 34 亿立方米，通过望亭水利枢纽入太湖 20 亿立方米，引长江水量、入太湖水量和引水时长均创新高，入太湖水质维持在 II ~ III 类，有效增加了流域优质水资源量，太湖水位保持在 3.00 米以上，太湖和太浦河下游水源地水质保持稳定。

Taihu Lake Basin: In anticipation of heavy rainfall brought by Typhoon No. 8 Co-may, the MWR and relevant water resources departments at provincial level directed the South Discharge Project along Hangzhou Bay and the North Discharge Project along the Yangtze River to draw down their water levels; during the period of typhoon-induced heavy rainfall, the water storage and regulation functions of Taihu Lake were leveraged to allow for flood drainage downstream. A total of 260 million m³ of water was discharged from Taihu Lake via the Wangyu and Taipu rivers, and 2.57 billion m³ was discharged through the Yangtze River channel, coastal outlets, and Hangzhou Bay estuaries. During this period, the maximum water level of Taihu Lake reached up to 3.90 m, 0.10 m above the warning level, and the flood situation in the basin remained generally stable. Two water diversion operations were carried out via the Wangyu River to transfer Yangtze River water to Taihu: 3.4 billion m³ of Yangtze River water via the Changshu complex and another 2.0 billion m³ via the Wangting complex. The volume of Yangtze River water diverted, the volume sent into Taihu Lake, and the duration of the diversion all reached record highs. The water quality entering Taihu Lake remained at Grade II - III, effectively increasing the volume of high-quality water resources in the basin. The water level of Taihu Lake remained above 3.00 m, and water quality at the Taihu and lower Taipu River water sources remained stable.

4.7 供水与灌溉保障

水利部组织开展干旱期间城乡供用水情况摸排分析，滚动统计因旱饮水困难人口、大牲畜数量，同时依托 12314 监督举报服务平台，做好农村饮水状况监测排查，督促指导旱区根据饮水困难人口分布、水源情况和供水工程规模类别等，因地制宜科学制定供水保障方案，及时采取水源调度、管网延伸、新建水源、拉水送水等措施确保供水安全。湖北省通过清淤疏浚、延伸管网等措施，改善汉江沿线 20 个水厂取水条件，克服低水位对取水的影响，受益人口 231 万人。广西壮族自治区建立台账，逐村落实送水责任单位、人员和经费，动态统计送水量和解决饮水困难的人口数量，加强供水工程运行管护、新建水源和应急供水等，及时解决旱区供水问题。云南省加强重点地区、重点人员用水保障，对偏远山区、集中供水工程无法覆盖的农村地区及“一老一小”重点人群，通过集体送水、群众自行拉水、供水站集中供水等方式，确保群众饮水安全。陕西省动员水利干部、基层水管员、镇村干部等 10 余万人，深入开展农村饮水安全“敲门入户”大排查，关中、陕南及时启动备用供水设施应急，并新打水源机井 864 眼，解决农村供水问题。

水利部指导旱区充分发挥大中型灌区抗旱主力军作用，逐灌区摸排作物种植结构、需水时段、需水量和灌水方式，优化灌溉用水计划，精准对接作物时令灌溉用水需求。山西省分区域制定灌溉计划及应急预案，落实用水总量控制和定额管理，确保应浇尽浇、应灌尽灌。江苏省优化灌溉制度，按区域、作物类别分时段调配水源，将用水管控到市际断面、到引水口门、到灌区田块，让有限的水资源发挥最大的抗旱效益。安徽、山东、河南等地 164 处大中型灌区夏伏旱期间累计引水 9.24 亿立方米，保障了 837 千公顷水稻、玉米等秋粮作物灌溉用水。湖北省启用泵站 4.2 万座、机电井 5.3 万眼，保障了汉江流域 524 千公顷农田灌溉用水需求。新疆维吾尔自治区强化区域内水资源调配，提前开展轮灌，严格控制灌溉定额，启动抗旱应急机电井 256 眼、泵站 21 座，累计完成抗旱浇灌 74.4 千公顷。

4.7 Water Supply and Irrigation

The MWR organized surveys and analyses of urban and rural water supply and consumption during the droughts, generating dynamic statistics on the number of people and large livestock facing drinking water difficulties due to drought. At the same time, relying on the “call 12314” public-supervision call platform, it monitored rural drinking water conditions, guided the drought-stricken areas to formulate suitable water supply guarantee plans based on the distribution of affected people, water source conditions, and the scale and category of water supply projects, and to promptly take measures such as water source scheduling, pipeline network extension, construction of new water sources, and water delivery to ensure water supply security. Hubei Province improved water intake conditions at 20 water treatment plants along the Hanjiang River through dredging and pipeline extension, thereby mitigating the impact of low water at intakes, benefiting 2.31 million people. The Guangxi Zhuang Autonomous Region established a registry, including designated units, personnel, and funding, to assign responsibility for water delivery by each village. Dynamic statistics were maintained on water delivery volumes and the number of people whose drinking water difficulties have been resolved, while multiple other measures were taken to ease water supply pressure during the drought, including the operation and maintenance of water supply projects, developing new water sources, and implementing emergency water supply measures. Yunnan Province strengthened water supply guarantee for key areas and vulnerable groups. For remote mountainous areas, rural regions not covered by centralized water supply schemes, and priority groups such as the elderly and children, the province ensured safe drinking water through collective water delivery, community-organized water delivery, and centralized supply from water stations. Shaanxi Province mobilized over 100,000 personnel, including water conservancy officials, grassroots water management staff, and town and village cadres, to conduct a comprehensive door-to-door inspection on rural drinking water security. In the Guanzhong and Shannan regions, emergency backup water supply facilities were promptly activated, and 864 new water abstraction wells were drilled to meet rural water supply needs.

The MWR guided drought-stricken areas to leverage the critical role of large and medium-sized irrigation districts. After district-by-district surveys of crop planting structures, water-demand periods, water requirements, and irrigation methods were conducted, irrigation plans were optimized to precisely meet the seasonal water needs of crops. Shanxi Province formulated irrigation plans and contingency planning by region, implemented total water

use control and quota management, and ensured that irrigation was guaranteed where it was needed. Jiangsu Province optimized its irrigation system by allocating water resources according to timing schedule, region characteristics and crop type, managing water use down to inter-city water sections, intake gates, and individual fields within irrigation districts, thereby maximizing the drought-relief benefits of limited water resources. During the mid-summer drought that hit Anhui, Shandong, and Henan provinces, 164 large and medium-sized irrigation districts borrowed 924 million m³ of water, ensuring irrigation for 837,000 ha of autumn crops such as rice and corn. Hubei Province activated 42,000 pumping stations and 53,000 motorized wells, meeting the irrigation needs of 524,000 ha of farmland in the Hanjiang River basin. The Xinjiang Uygur Autonomous Region strengthened the allocation of water resources within the region, implemented rotational irrigation in advance, strictly controlled irrigation quotas, and activated 256 emergency motorized wells and 21 pumping stations for drought relief, cumulatively completing irrigation for 74,400 ha under drought relief.



山西夹马口灌区吴王水源站持续供水（摄于5月28日）

Water was continuously supplied by the Wuwang water source station in the Jiamakou irrigation district, Shanxi (photographed on May 28)

4.8 技术支撑

各级水利部门共派出工作组 5.90 万组次、25.59 万人次，专家组 1.35 万组次、5.03 万人次提供防汛抢险和抗旱保供技术支持，指导处置水利工程险情 1.53 万处。黄委、水利部信息中心和中国水利水电科学研究院（以下简称“中国水科院”）等单位发挥技术优势，全力做好内蒙古大黑河、美岱沟流域洪水风险分析与技术支撑，指导联合调度哈素海水库上游万家沟、美岱水库和沟道涵闸，尽力压减哈素海水库入库水量，开辟多个临时蓄滞洪区蓄洪，加固哈素海退水渠左堤，强化堤防巡查防守，对哈素海退水渠、大黑河、临时蓄滞洪区实施拓卡除障，及时处置工程险情，成功实现“人员不伤亡、哈素海水库不垮坝、黄河大堤不决口、重要保护对象不受冲击”的预期目标。坚持问题导向、结果导向，中国水科院等技术支撑单位及专家充分利用卫星无人机遥感监测、数字孪生洪水推演技术、国家山洪灾害监测预报预警平台、全国旱情监测预警综合平台、洪水风险实时推演与动态展示系统等，及时复盘检视海河“25·7”区域性大洪水、广东肇庆怀集暴雨洪水、西藏吉隆口岸冰湖溃决、贵州红旗水库受淹、内蒙古哈素海水库高水位运行等 16 场重大和典型洪涝、山洪、干旱灾害事件及其应对过程，总结经验，查找防御短板，提出改进建议。中国水科院联合水利部信息中心开展 130 座重点冰湖遥感监测、震损灾情评估、洪涝灾情快速监测分析。水利部持续完善水旱灾害防御技术标准体系，组织开展洪水风险评估与区划导则、洪水风险图编制导则、水文干旱等级、防洪治涝工程项目规范、蓄滞洪区设计标准、崩岸抢护技术导则等 10 余项国家标准、行业标准制修订工作，《卫星遥感水利监测技术要求 第 5 部分：水旱灾害》（SL/T 750.5—2025）、《洪水影响评价技术导则》（SL/T 808—2025）等 2 项标准颁布实施。

4.8 Technical Support

Water resources departments at various levels dispatched a total of 59,000 work teams (involving 255,900 personnel) and 13,500 expert teams (involving 50,300 personnel) to provide technical support for flood control, emergency response, and drought relief efforts, guiding the handling of 15,300 emergency situations at water conservancy projects. The Yellow River Commission, the Information Center of the MWR, and the China Institute of Water Resources and Hydropower Research (hereinafter “IWHR”) leveraged their technical expertise to support flood risk analysis and technical assistance for the Dahei and Meidaigou river basins in Nei Mongol. They guided the joint operation of the Wanjiagou and Meidai reservoirs and channels, sluices, and gates upstream of the Hasuhai Reservoir to minimize inflow into the reservoir, established multiple temporary flood detention areas



to hold floodwaters, reinforced the left embankment of the Hasuhai drainage channel, intensified patrols and protection along the embankments, cleared obstructions from the Hasuhai drainage channel, the Dahei River, and the temporary flood detention areas, and promptly addressed hazards. These efforts successfully achieved the expected objectives of “no casualties, no breach of the Hasuhai dam, no breach of the Yellow River main levee, and no significant impact on key protected targets”. With a practical and problem-oriented approach, IWHR and other technical support units reviewed and analyzed the “July 2025” Haihe River large flood, the rainstorm floods in Huaiji, Zhaoqing, Guangdong, the breach of the glacial lake at Jilong border crossing in Xizang, the inundation of the Hongqi Reservoir in Guizhou, and the high-water-level operation of the Hasuhai Reservoir in Nei Mongol, among 16 major and typical flood, flash flood, and drought disasters, and their response processes. Satellite and drone remote sensing monitoring, digital twin flood simulation technology, the National Flash Flood Disaster Monitoring, Forecasting, and Early Warning Platform, the National Drought Monitoring and Early Warning Integrated Platform, and the real-time flood risk simulation and dynamic display system were fully utilized. They summarized lessons learned, identified shortcomings in responses, and proposed recommendations for improvement. IWHR, in collaboration with the MWR Information Center, conducted remote sensing monitoring of 130 key glacial lakes, assessed earthquake-induced damage, and performed rapid monitoring and analysis of flood and drought damages. The MWR has continued to refine the technical standards system for flood and drought disaster prevention. It has organized the formulation and revision of more than 10 national and industry standards, including guidelines for flood risk assessment and zoning, guidelines for flood risk mapping, hydrological drought classification, specifications for flood control and drainage projects, design standards for flood detention areas, and technical guidelines for emergency bank collapse protection. Two standards, namely *Technical specifications for satellite remote sensing in water resources monitoring—Part 5: Water and drought disasters* (SL/T 750.5—2025) and *Technical guideline for flood impact assessment* (SL/T 808—2025), have been rolled out.

4.9 部门协作

水利部派员参加国家防总办公室防汛抗旱专题会商 56 次，及时通报洪水预测预报情况，共同核定全国洪涝干旱灾情，为抗洪抢险、抗旱减灾提供支撑。及时向有关部委和军队系统提供洪水预警信息，共享雨水汛旱数据。会同中国气象局持续完善山洪灾害气象预警发布机制，为做好各行业洪涝灾害防御提供支撑。加强与能源、交通运输、农业农村等部门行业沟通协

调，全方位推进现代化水库运行管理矩阵建设，提高水库防洪减灾能力，确保水库运行安全。会同农业农村部、应急管理部、中国气象局印发《关于加强农业防灾减灾救灾能力建设的指导意见》，支撑保障粮食和重要农产品稳定安全供给。长江、珠江枯水期间，与交通、环境保护等部门构建信息共享、联合会商合作机制，在确保供水安全的前提下，统筹兼顾生态、航运、发电等需求，实现多方共赢。水利部协调财政部下达中央水利救灾资金防汛方向 21.57 亿元、抗旱方向 3.295 亿元，支持地方做好安全度汛、隐患排查整治、防洪工程设施水毁修复、抗旱应急水源工程建设、提水运水设备购置等工作。

4.9 Cross-sectoral Collaboration

The MWR participated in 56 consultations on flood control and drought relief organized by the Office of the SFDH, reporting on flood forecasts and predictions, helping verify national disaster situations, and providing support for flood control, emergency response, drought relief, and disaster mitigation efforts. Flood early warning information was promptly provided to relevant ministries and the military, sharing rainfall, flood, and drought data. In collaboration with the China Meteorological Administration, the mechanism for issuing meteorological early warnings for flash floods was improved to support flood and drought prevention by various sectors. Communication and coordination with ministries in charge of energy, transportation, and agriculture and rural affairs were strengthened to advance the development of a modern reservoir operation and management matrix, enhance reservoir resilience against disasters, and ensure reservoir operational safety. In collaboration with the Ministry of Agriculture and Rural Affairs, the Ministry of Emergency Management, and the China Meteorological Administration, the MWR issued the *Guiding Opinions on Strengthening the Capacity for Disaster Prevention, Mitigation, and Relief in the Agricultural Sector*, which buttress the stable and secure supply of grain and other key agricultural produce. In response to the low-water periods in the Yangtze and Pearl rivers, the MWR established information-sharing and joint consultation mechanisms with ministries in charge of transportation and environmental protection; while ensuring water supply security, co-benefits including ecology, navigation, and power generation were achieved. The MWR coordinated with the Ministry of Finance to allocate 2.157 billion RMB in central water conservancy disaster relief funds for flood control and 329.5 million RMB for drought relief, supporting local authorities in ensuring flood safety, hazard rectification, repairing water-induced project damages, constructing emergency water sources for drought relief, and purchasing water pumping and transportation equipment.

4.10 信息发布与宣传

水利部部长李国英在全国两会“部长通道”、国新办“十四五”水利高质量发展成就新闻发布会上权威发布水利部构建完善水旱灾害防御“三大体系”、全力保障防洪安全等工作 and 成效；在第 19 届世界水资源大会上阐释了中国在习近平总书记治水思路指引下开展洪水控制、洪水利用、洪水塑造的创新理念和实践成效，并向国际社会发出加快转变洪水传统治理管理理念和模式，构建洪水控制、洪水利用、洪水塑造的系统解决方案等重大倡议。水利部探索建立汛期水旱灾害防御例行新闻发布机制，组织召开黄河防凌、抗旱保灌和“龙舟水”防御、台风“蝴蝶”暴雨洪水防御、“七下八上”防汛关键期水旱灾害防御等 5 场新闻发布会（通气会），阶段性总结展示水利部门打好打赢防御硬仗的工作部署、举措及成效。及时通过“中国水利”微信公众号、水利部官网及中国水利报社媒体矩阵等发布新闻通稿 120 余篇，全方位、多角度、立体化展示水利部门防御工作和成效。充分发挥“新闻直通车”机制优势，加强与中央媒体沟通对接，滚动推送重要汛旱情及水利部防御工作动态 210 余期，组织协调专家 100 余人次接受媒体采访，全力配合总台央视主汛期驻水利部采访报道、防汛重点专题节目和科普节目制作等。海河“25·7”区域性大洪水期间，协调中央电视台多个频道、栏目 40 余名记者驻水利部采访报道，通过直播连线、滚动播报等形式集中深入报道水利部防御工作情况。人民日报、新华社、中央电视台、中央人民广播电台、光明日报、经济日报 6 家中央主要媒体全年刊（播）发水旱灾害防御相关原发报道 4189 篇，其中中央电视台《新闻联播》栏目播发防汛抗旱报道 54 条，《焦点访谈》《新闻 1+1》栏目播出防汛专题节目 12 期，重点反映水利部门防御举措和成效；中央电视台新闻频道《全民安全公开课 | “汛”速预防》直播节目邀请水利部专家现场访谈，重点介绍“湖南省桃源县牛车河镇山洪灾害预警及时无一伤亡”等防御工作和成功案例。

4.10 Information Release and Publicity

Li Guoying, Minister of Water Resources, announced the Ministry's efforts and achievements—including the establishment and improvement of the three systems for flood and drought disaster prevention and the full-scale efforts on flood safety—during the “Minister's Corridor” at the Two Sessions, as well as at the State Council Information Office's press conference on the achievements of high-quality water resources development during the 14th Five-Year Plan period; At the 19th IWRA World Water Congress, the Minister elaborated on China's innovative concepts and practical achievements in flood

control, floodwater utilization, and artificial creation of flood pulses, guided by President Xi Jinping's water governance philosophy, and issued major initiatives to the international community calling for an accelerated shift away from traditional flood management concepts and models toward the development of systematic solutions for flood control, floodwater utilization, and for-purpose flood pulse recreation. The MWR has explored the establishment of a routine press briefing mechanism for flood and drought disaster prevention during the flood season, organizing five press briefings on ice jam control on the Yellow River, drought relief and irrigation support, prevention against the Dragon Boat rainy season, defending against rainstorms and floods caused by Typhoon Wutip, and prevention efforts during the critical "late July-early August" flood season. These briefings provided periodic summaries of the water resources sector's work arrangements, measures, and achievements in flood and drought prevention. More than 120 press releases were promptly published through the Ministry's official WeChat account, official website, and the media matrix of the China Water Resources News, providing a comprehensive and multidimensional showcase of the sector's disaster prevention efforts and achievements. Via the "News Express" mechanism, the communication and coordination with central media outlets were strengthened, and over 210 updates on critical flood and drought conditions as well as the Ministry's major efforts were rolled out. The Ministry mobilized over 100 experts for media interviews and fully supported China Central Television's on-site reporting during the main flood season, as well as the production of special programs and science popularization programs. During the Haihe large flood event during July, the Ministry coordinated over 40 journalists from multiple CCTV channels and programs to conduct on-site reporting at the Ministry, providing in-depth coverage through live broadcasts and rolling news updates. Six major central media outlets—People's Daily, Xinhua News Agency, CCTV, China National Radio, Guangming Daily, and Economic Daily—published or broadcast a total of 4,189 original reports on flood and drought disaster prevention throughout the year. Among these, *Xinwen Lianbo* (News Broadcast) on CCTV aired 54 reports on flood control and drought relief, while the programs *Focus* and *News 1+1* aired 12 special episodes on flood control, highlighting the measures and achievements of the water resources sector. The live broadcast *Public Safety Open Class | Rapid Flood Prevention* on CCTV News invited experts from the MWR for on-site interviews, focusing on prevention efforts and successful cases such as the timely early warning for flash floods in Niuchehe Town, Taoyuan County, Hunan Province, which resulted in zero casualties.

4.11 防御成效

2025 年，水利部及地方各级水利部门有效实施防洪“四预”措施，科学调度运用水库、河道及堤防，及时指导开展险情抢护，成功应对江河洪水，实现全国水库无一垮坝，大江大河重要堤防无一决口。全国减淹城镇 1082 座次，减淹耕地面积 553.59 千公顷，避免人员转移 305.78 万人次，最大程度保障人民群众生命财产安全及重要基础设施安全运行。锚定“确保城乡供水安全、确保灌区农作物时令灌溉用水需求、确保规模化养殖和大牲畜用水安全”目标，精准范围、精准对象、精准时段、精准措施，积极防御、主动应对干旱，全国各地累计完成抗旱浇灌面积 8889 千公顷，因旱饮水困难人口均采取措施得到保障，有力保障了供水安全、粮食安全、生态安全。

4.11 Prevention Outcomes

In 2025, the MWR and local water resources departments effectively implemented the four preemptive pillars on flood control, scientifically managed and operated reservoirs, waterways, and embankments, provided timely guidance for emergency repairs, and successfully responded to river floods, ensuring that no reservoirs collapsed and no key embankments along major rivers breached across the country. Nationwide, 1,082 instances of urban inundation were prevented, 553,590 ha of cropland were spared from flooding, and 3.0578 million people were spared from evacuation, thereby protecting lives and property as well as the safe operation of critical infrastructure to the greatest possible extent. Focusing on the objectives of ensuring urban and rural water supply security, meeting seasonal irrigation needs in irrigation districts, and ensuring water security for large-scale animal husbandry and large livestock, precise drought relief efforts were made, being precise in scope, targets, time periods, and measures. A total of 8.889 million ha of drought-stricken cropland were supported. Measures were taken to ensure water supply for all populations facing drinking water difficulties due to drought. As a result, water supply security, food security, and ecological security were guaranteed.

表 4-5 2025 年各流域汛期大中型水库防洪调度效益情况

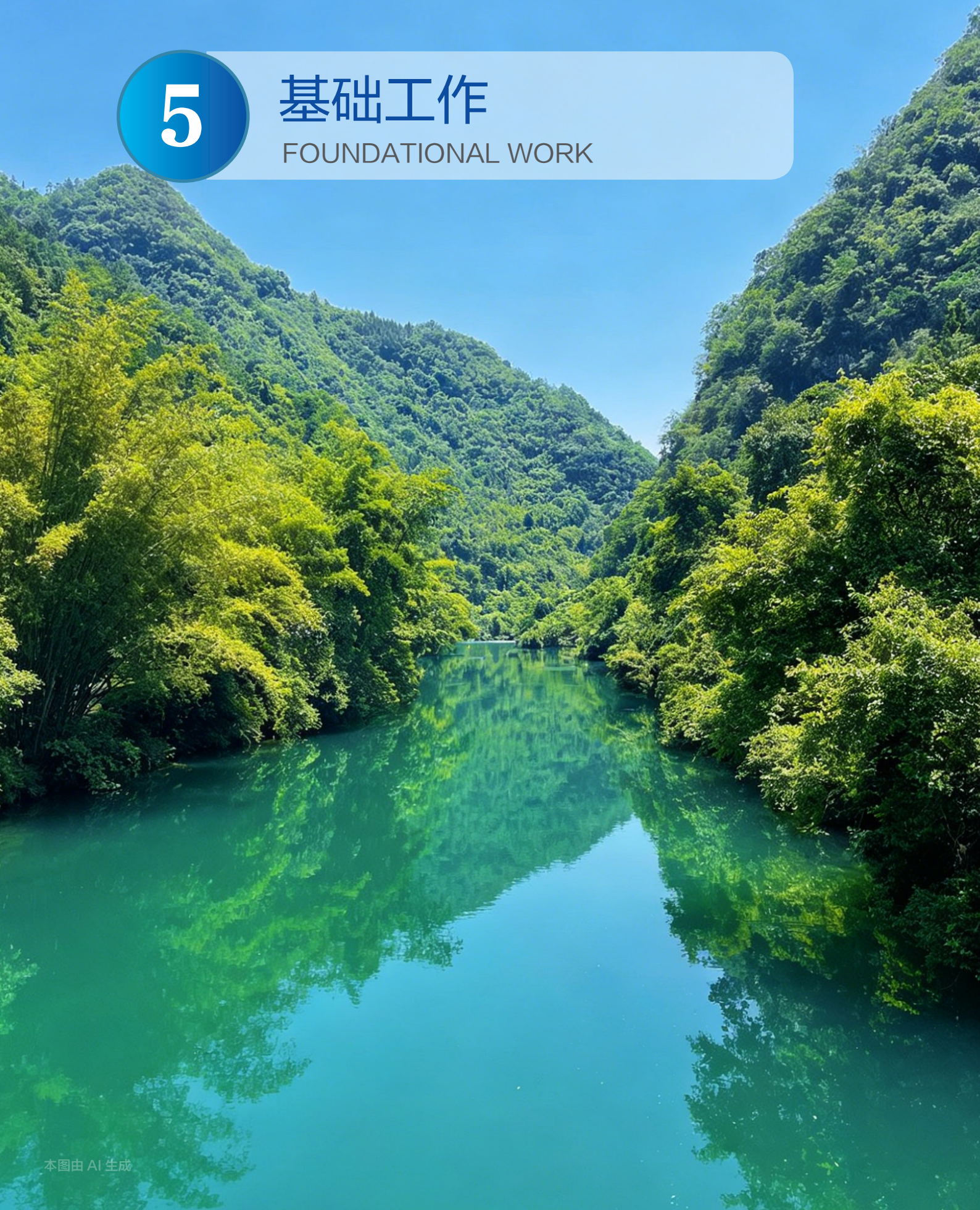
Table 4-5 Flood control effectiveness of large and medium-sized reservoirs in major river basins during the 2025 flood season

流域 Basin	减淹城镇 / 座次 Number of urban settlements spared from flooding	减淹耕地 / 千公顷 Area of cropland spared from flooding / 1,000 ha	避免人员转移 / 万人次 Avoided evacuations / 10,000 person-times
全国 Nationwide	1082	553.59	305.78
长江 The Yangtze River	122	159.38	88.37
黄河 The Yellow River	41	107.45	48.38
淮河 The Huaihe River	5	2.57	2.10
海河 The Haihe River	68	37.67	46.19
珠江 The Pearl River	586	185.93	81.19
松辽 The Songhua-Liaohe River	56	29.00	3.56
太湖 The Taihu Lake	204	31.59	35.99



基础工作

FOUNDATIONAL WORK



5.1 工作体系

责任落实方面：水利部会同相关部门向社会公布了 2025 年全国防汛抗旱和大江大河、大型及防洪重点中型水库、主要蓄滞洪区等 2792 名责任人名单，接受社会监督。按“分级负责、属地管理”的原则，全面落实小型水库防汛“三个责任人”（行政责任人、技术责任人、巡查责任人）近 17 万人，大中型淤地坝“三个责任人”5.26 万人，山洪灾害防御预警发布和转移包保责任人 79.7 万人，3269 项在建水利工程责任人。浙江省水利厅将国资、能源、农业等非水利部门管理的 109 座水库全量纳入监管范围，实现全省 4266 座水库监管全覆盖。湖北省严格落实在建水利工程责任人，明确要求水库类建设项目主汛期一律不得开展破坝穿坝、溢洪道拆除等施工，河道堤防类项目的近堤深基坑、穿堤建筑物等涉及防洪安全部分严禁在主汛期施工。陕西省全面落实 3.8 万座淤地坝防汛责任人，汛期对下游有人居住的 725 座淤地坝开展常态化、全覆盖式责任人到位情况电话抽查，确保责任人上岗到位。

决策支持方面：水利部减灾中心（防御中心）汛期常态化支持防汛应急值守，随时派专家赴一线开展技术指导和灾害复盘。地方各级水利部门持续加强水旱灾害防御技术支持团队和力量配备，有 23 个省（自治区、直辖市）水利（务）厅（局）组建水旱灾害防御技术支撑单位，并充分利用数字孪生技术，协助提升防洪“四预”能力。福建省水利厅持续推进“千库联调”系统建设，通过水利“一张图”汇聚各类信息，努力实现预报精准化、预警超前化、预演数字化、预案科学化。湖南省水利厅持续实施基层水利特岗人员定向培养计划，为县（市、区）基层水管单位提供水旱灾害防御人才支持。广西壮族自治区水利厅制定《水旱灾害防御综合值班手册》《洪水防御案例（信息）快速报送机制》，进一步提升防御基础能力。

调度指挥方面：各级水利部门严格执行《水利部重大水旱灾害事件调度指挥机制》，确保水旱灾害防御工作反应迅速、指挥有力、措施得当、调度有方、落实有效。北京密云、甘肃榆中、内蒙古大黑河美岱沟等地洪涝灾害发生后，水利部第一时间启动机制，国家防总副总指挥、水利部部长李国英主持会商研判，调度流域重点防洪工程，前方工作组和后方支持团队密切协同，做到应急处置工作全流程、全链条、全方位闭合。地方各级水利部门建立健全汛期会商机制，及时作出工作部署。江苏省水利厅建立多部门联合会商机制，在防汛防台风关键期组织应急、气象等部门一天两会商，指导有关地区和部门做好防范应对。黑龙江省齐齐哈尔、黑河等地 9 座小型水库超校核水位期间，松辽委和黑龙江省水利厅联合会商，共同研究决定采取加强监测、精细调度、预置抢险设备和队伍等措施，成功应对水库超校核水位运行险情，确保了水库安全度汛和下游人员安全。2025 年，水利部印发《水利部抗震救灾调度指挥机制》。西藏定日 6.8 级地震、甘肃陇西 5.6 级地震、西藏拉孜 5.5 级地震等地震灾害发生后，水利

部迅即启动机制，第一时间组织开展灾后遥感应急监测与风险分析，指导地方开展隐患排查、险情处置、震损供水管网修复等工作，确保受影响地区人民生命安全、饮水安全。

5.1 Work System

Implementation of responsibilities: The MWR, in conjunction with relevant ministries, published a list of 2,792 responsible officials for the 2025 national flood control and drought relief efforts—covering major rivers, large and key medium-sized reservoirs, and major flood detention areas—for public oversight. In accordance with the principle of “tiered responsibility and local management”, full implementation was ensured regarding the “three responsible officials” (administrative, technical, patrolling and guarding) for flood control at small reservoirs (totaling nearly 170,000 personnel), the “three responsible officials” for large and medium-sized check dams (52,600 personnel), the responsible officials for issuing early warnings and overseeing evacuations for flash floods (797,000 personnel), and the responsible officials for 3,269 water conservancy projects under construction. The Zhejiang Provincial Department of Water Resources incorporated 109 reservoirs managed by sectors other than water (such as state-owned assets, energy, and agriculture) into its regulatory umbrella, so that all the 4,266 reservoirs within the province were under unified regulation. Hubei Province has strictly enforced the identification of responsible personnel for water conservancy projects under construction, explicitly prohibiting construction activities (such as dam explosion and tunneling, spillway removal) during the main flood season for all reservoir projects under construction. For river embankment projects, construction involving flood safety (such as deep excavations near embankments or embankment-penetrating structures) is strictly prohibited during the main flood season. Shaanxi Province designated responsible officials for flood control for all the 38,000 check dams within the province. During the flood season, it conducts routine telephone spot checks on the responsible officials for the 725 check dams with human settlements downstream, ensuring duty fulfillment.

Decision-making support: The Flood and Drought Disaster Prevention Center of the MWR provided routine on-duty emergency support during the flood season, dispatching experts to the site to provide technical guidance and conduct post-disaster reviews. Local water resources departments continued to strengthen the staffing and capabilities of technical support teams for flood and drought disaster prevention. Water resources departments in 23 provinces/autonomous regions/municipalities established dedicated technical support units and made full use of digital twin technology to help enhance the the four preemptive capabilities for flood control. Fujian Provincial Department of Water Resources continued with the development of an unified scheduling system for its 1,000-strong reservoirs, aggregating

various types of information onto one meta-map, striving to achieve precise forecasting, early warning, digital simulation, and scientific contingency planning. Hunan Provincial Department of Water Resources continued with the targeted training program for special-duty personnel at the grassroots level, providing talent support for flood and drought disaster prevention to county-level (city, district) water management units. Guangxi Zhuang Autonomous Region Department of Water Resources has formulated the *Duty Manual for Flood and Drought Disaster Prevention and the Rapid Reporting Mechanism for Flood Defense Cases (Information)*, enhancing basic disaster prevention capabilities.

Dispatch and command: Water resources departments at various levels strictly implemented the *MWR Dispatch and Command Mechanism for Major Water and Drought Disaster Events* to ensure that prevention efforts were rapid and responsive, strong in command, appropriate in measures, effective in coordination, and successful in implementation. In the aftermath of flood disasters in Miyun (Beijing), Yuzhong (Gansu) and Meidaigou and Dahei rivers (Nei Mongol), the MWR immediately activated the response mechanism. Li Guoying, Vice Commander-in-chief of the SFDH and Minister of Water Resources, presided over consultations and gave commands to the key flood control projects in the affected river basins. Frontline task forces and rear support teams worked in tandem to ensure a fully integrated, end-to-end, and comprehensive emergency response process. Local water resources departments established and improved flood-season consultation mechanisms to enable prompt work arrangements. Jiangsu Provincial Department of Water Resources established a cross-departmental joint consultation mechanism, organizing twice-daily consultations with emergency management and meteorological departments during critical periods to guide emergency efforts. When nine small reservoirs in Qiqihar and Heihe of Heilongjiang Province went beyond their check flood levels, the Songliao Commission and the Heilongjiang Provincial Department of Water Resources held joint consultations and rolled out measures such as enhanced monitoring, precise scheduling, and the pre-positioning of emergency response equipment and teams. These actions successfully addressed the operational risks posed by the reservoirs exceeding their check flood levels, ensuring their safety during the flood season and the safety of people downstream. In 2025, the MWR issued the *MWR Dispatch and Command Mechanism for Earthquake Relief*. In the aftermath of seismic disasters such as the 6.8-magnitude earthquake in Dingri, Xizang; the 5.6-magnitude earthquake in Longxi, Gansu; and the 5.5-magnitude earthquake in Lazi, Xizang, the MWR promptly activated the mechanism. It immediately organized remote sensing emergency monitoring and risk analysis, and guided local authorities in conducting hazard inspections, emergency response, and repairs to earthquake-damaged water supply networks, thereby ensuring the safety of lives and drinking water supply in the affected areas.

5.2 方案预案

水利部批复《2025年长江流域水工程联合调度运用计划》《2025年珠江流域水工程联合调度运用计划》《2025年雄安新区起步区安全度汛方案》和《三峡水库2025年蓄水计划》。有关流域管理机构组织对国家蓄滞洪区运用预案进行修订完善。

长江委印发《2025年度金沙江中游梯级水库联合优化调度方案》《2025年度金沙江下游梯级水库联合优化调度方案》，组织批复丹江口、白鹤滩、苏洼龙、象鼻岭等4个跨省水库（水电站）防洪抢险应急预案和旭龙水电站超标准洪水应急预案。

黄委组织修订黄河水工程联合防洪调度方案、调水调沙预案、中下游洪水应急调度方案和超标准洪水防御预案，批复11座黄委直接调度管理的大型水库年度调度运用计划、黄河古贤水利枢纽工程度汛方案，沿黄有关省（自治区）、委属有关单位修订所辖区黄河防洪预案、重要水文站测报方案、洪水预报预案、通信保障预案及物资保障预案等。

淮委组织编制《2025年淮河流域水工程联合调度运用计划》，修订流域河道、大型水库等主要防洪工程汛期调度运用计划。

海委组织修订滦河、北三河、永定河、大清河、子牙河、漳卫河超标准洪水防御预案，优化超标准洪水监测预报预警措施和防洪控制性工程调度规则。

珠江委组织批复21座流域重点水库汛期调度运用计划，修订郁江、桂江、漠阳江、南渡江等11条河流洪水调度方案。

松辽委组织批复尼尔基、察尔森、丰满、白山等水库2025年汛期调度运用计划，修编8个水库、24个河道站、3个枢纽工程的洪水预报方案。

太湖局组织修订《新安江流域防洪监测预报预警信息共享和联防联控机制》，编制《2025年苏州河西闸防汛应急调度规则》。

全国已编制江河湖泊和重要水工程应急水量调度预案98个。

5.2 Contingency Planning

The MWR approved the *2025 Joint Dispatch and Operation Plan for Water Projects in the Yangtze River Basin*, the *2025 Joint Dispatch and Operation Plan for Water Projects in the Pearl River Basin*, the *2025 Flood Season Safety Plan for the Start-up Area of Xiong'an New Area*, and the *2025 Impoundment Plan for the Three Gorges Reservoir*. Relevant river basin authorities organized the revision of contingency plans for the operation of national flood detention areas.

The Changjiang Commission issued the *2025 Optimized Joint Dispatch Plan for*

Cascade Reservoirs in the Middle Reaches of the Jinsha River and the 2025 Optimized Joint Dispatch Plan for Cascade Reservoirs in the Lower Reaches of the Jinsha River, and approved the flood control and contingency planning for four inter-provincial reservoirs (hydropower stations)—Danjiangkou, Baihetan, Suwalong, and Xiangbiling—as well as the contingency planning for the Xulong Hydropower Station in the event of floods exceeding design standards.

The Yellow River Commission organized the revision of the joint flood control dispatch plan for Yellow River water projects, the water and sediment regulation plan, the emergency dispatch plan for floods in the middle and lower reaches, and the contingency planning for defending against floods exceeding design standards. It reviewed and approved the annual operation and dispatch plans for 11 large reservoirs directly managed by the Commission, as well as the flood season safety plan for the Guxian Water Conservancy Project. Relevant riverside provinces/autonomous regions and the Commission's subordinate units revised flood control contingency plans in their respective jurisdictions, monitoring and reporting plans for key hydrological stations, flood forecasting plans, communication support plans, and material supply plans.

The Huaihe Commission organized the compilation of the *2025 Joint Dispatch and Operation Plan for Water Projects in the Huaihe River Basin* and revised the flood season operation plans for major flood control structures such as river channels and large reservoirs.

The Haihe Commission organized the revision of flood control contingency plans for the Luanhe River, Beisan rivers, Yongding rivers, Daqing River, Ziya River, and Zhangwei River in the event of floods exceeding design standards, and optimized monitoring, forecasting, and early warning measures for such floods, as well as the dispatch rules for backbone flood control structures.

The Pearl River Commission organized the approval of flood season operation and dispatch plans for 21 key reservoirs in the basin and revised flood control plans for 11 rivers, including the Yujiang, Guijiang, Moyang, and Nandu rivers.

The Songliao Commission organized the approval of 2025 flood season dispatch and operation plans for reservoirs such as Nierji, Charsen, Fengman, and Baishan, and revised flood forecasting plans for 8 reservoirs, 24 river stations, and 3 water engineering complexes.

The Taihu Authority organized the revision of the *Mechanism for Information Sharing of Flood Monitoring, Forecasting, and Early Warning and Joint Prevention and Control in the Xin'anjiang River Basin* and drafted the *2025 Emergency Flood Control Dispatch Rules for the West Gates of the Suzhou River*.

Nationwide, 98 contingency plans for water dispatch from rivers, lakes, and major water projects were formulated.

5.3 蓄滞洪区建设管理

水利部印发《蓄滞洪区建设管理三年行动方案（2025—2027年）》，逐流域、分年度明确重点建设任务。加快推进国家蓄滞洪区建设，长江流域杜家台，淮河流域城东湖、城西湖、董峰湖、寿西湖，海河流域大陆泽、宁晋泊、青甸洼、永年洼等9处国家蓄滞洪区基本完成现行规划建设任务，全国完成规划建设任务的国家蓄滞洪区达48处；淮河干流浮山以下段、峡涡段行洪区调整和建设工程，天津大黄堡蓄滞洪区分区建设工程开工建设；湖北武湖等国家蓄滞洪区建设项目前期工作取得阶段性进展。安排中央财政水利发展资金3亿元，支持地方开展国家蓄滞洪区工程维修养护，保障工程良性运行。严格落实《水利部关于加强蓄滞洪区内非防洪建设项目洪水影响评价管理的意见》，提级从严开展洪评审批，加强事中事后监管，全年受理国家蓄滞洪区内127个非防洪建设项目洪水影响评价报告，对其中38个作出行政许可。常态化开展国家蓄滞洪区内非防洪建设项目监测监管，累计下发遥感疑似图斑8期1152处，督促地方逐一核查、加快整改，违建项目增量得到有效控制。完成《蓄滞洪区运用补偿办法》修改，于6月23日以国务院令公布施行，进一步优化调整补偿对象、范围和程序。深入推进蓄滞洪区管理条例立法前期工作，加快修编全国蓄滞洪区建设与管理规划，全面完成98处国家蓄滞洪区划界技术工作。印发《数字孪生蓄滞洪区建设三年行动方案（2025—2027年）》，组织加快构建全国蓄滞洪区数字孪生综合平台，指导江西康山、湖北杜家台等蓄滞洪区开展数字孪生建设。

5.3 Construction and Management of Flood Detention Areas

The MWR issued the *Three-Year Action Plan for the Construction and Management of Flood Detention Areas (2025-2027)*, specifying key tasks by river basin and by year. The construction of national flood detention areas has accelerated. Nine national flood detention areas (Dujiatai in the Yangtze River Basin; Chengdonghu, Chengxihu, Dongfenghu, and Shouxihu in the Huaihe River Basin; and Daluze, Ningjinbo, Qingdianwa, and Yongnianwa in the Haihe River Basin) have been almost completed according to current plans, bringing

the total number of completed national flood detention areas nationwide to 48. Construction has commenced on the flood diversion zone adjustment and construction for the section downstream of Fushan and the Xiawo section on the Huaihe mainstream, as well as on the phased construction of the Tianjin Dahuangbao flood detention area; preliminary work on other projects like Wuhu in Hubei has achieved progress. A total of 300 million RMB in central government water conservancy development funds was allocated to support the local in maintaining and repairing national flood detention areas to ensure proper operation. The *Opinions of the Ministry of Water Resources on Strengthening the Management of Flood Impact Assessments for Non-Flood Control Construction Projects within Flood Detention Areas* were strictly implemented. The approval process for flood impact assessments was made more rigorous, and oversight during and after project implementation was strengthened. Throughout the year, 127 flood impact assessment reports for non-flood control construction projects within national flood detention areas were reviewed, and administrative permits were issued for 38 of them. Routine monitoring and supervision of such projects was carried out, 1,152 suspected spots identified through remote sensing were issued in eight sequences, and local authorities were urged to verify each case and speedily rectify the issues, effectively limiting the increase in illegal construction projects. The *Compensation Measures for the Operation of Flood Detention Areas* was revised and went into effect by a State Council decree on June 23, further optimizing and adjusting the scope, criteria, and procedures for compensation. The preliminary legislative work for the pending regulations on the management of flood detention areas saw significant progress, the revision of the national plan for the construction and management of flood detention areas was accelerated, and the technical work on demarcating 98 national flood detention areas was completed. The *Three-Year Action Plan for the Digital Twinning of Flood Detention Areas (2025-2027)* was issued. Efforts were made to accelerate the construction of a comprehensive national digital twin platform for flood detention areas, and guidance was provided to flood detention areas such as Kangshan in Jiangxi and Dujiatai in Hubei to carry out developing their digital twins.

5.4 山洪灾害防治

水利部协调财政部下达 2025 年中央水利发展资金 20 亿元，支持 29 个省（自治区、直辖市）开展山洪灾害监测能力提升、2000 个小流域山洪灾害“四预”能力建设、2077 个县群测群防体系建设、93 条重点山洪沟防洪治理及运行维护。开展 2022 年以来水利测雨雷达和小流域“四预”能力建设应用情况调研，印发《关于做好 2025 年山洪灾害防御重点工作的通知》《关于突出抓好“七下八上”防汛关键期山洪灾害防御工作的通知》，对水利测雨雷达建设应用和检视评估等工作提出明确要求。组织召开山洪灾害防御工作现场会、项目建设管理会、西部地区技术帮扶专项培训会、线上技术培训会等 10 余次，指导地方开展风险隐患排查整治、动态预警阈值调整应用、水利测雨雷达建设、小流域山洪灾害“四预”能力建设、山洪灾害防御预案修订完善等任务，调度部署项目建设管理重点工作。

5.4 Flash Flood Disaster Management

The MWR coordinated with the Ministry of Finance to allocate 2 billion RMB in 2025 central water conservancy development funds to support 29 provinces/autonomous regions/municipalities in enhancing flash flood monitoring capabilities, developing the four preemptive capabilities for flash flood prevention in 2,000 small watersheds, establishing community-based monitoring and prevention systems in 2,077 counties, and flood control management and operation and maintenance for 93 key flash flood gullies. A survey was conducted on the application of hydrological rain radar and the four preemptive capabilities in small watersheds since 2022. Issued *the Notice on Key Tasks for Flash Flood Disaster Prevention in 2025* and *the Notice on Prioritizing Flash Flood Disaster Prevention During the Critical “late July-early August” Flood Period*, setting forth clear requirements for the construction, application, and evaluation of hydrological rain radar. More than 10 meetings of various kinds were organized, including on-site work meetings, project construction management meetings, specialized technical assistance training sessions for the western region, and online technical training sessions. Local authorities were guided in carrying out tasks such as identifying and rectifying risk hazards, adjusting and applying dynamic early warning thresholds, constructing hydrological rainfall radars, building the four preemptive capabilities for flash flood disasters in small watersheds, and revising and improving flash flood disaster prevention plans, as well as coordinating and deploying key project construction and management tasks.

5.5 洪水风险图编制

水利部协调财政部下达 2025 年中央水利发展资金 6 亿元，支持 31 个省（自治区、直辖市）开展 405 处防洪保护区、49 处蓄滞洪区、48 处洪泛区、14 座防洪城市以及 3022 座重点中小型水库洪水风险图编制，洪水风险区划图更新和洪水灾害防治区划图更新，洪水风险实时分析能力与成果共享，成果应用体系建设等。水利部编制完成《洪水风险图编制和专项评估成果汇交共享细则》，组织开发洪水影响分析与损失评估软件、避洪转移分析软件和洪水风险图绘制系统，强化技术指导与培训，保障成果质量；组织开发洪水风险图编制成果汇交系统和洪水风险实时推演与动态展示系统，加强对全国洪水风险图汇交成果的管理和应用。

5.5 Flood Risk Mapping

The MWR coordinated with the Ministry of Finance to allocate 600 million RMB in 2025 central water conservancy development funds to support 31 provinces/autonomous regions/municipalities in compiling flood risk maps, updating flood risk zoning and flood disaster prevention and control zoning for 405 flood protection zones, 49 flood detention areas, 48 floodplains, 14 key flood control cities, and 3,022 key small and medium-sized reservoirs, and enhanced the sharing of real-time flood risk analysis capabilities and outcomes, as well as the development of a results application mechanism. The MWR compiled the *Detailed Rules for the Submission and Sharing of Flood Risk Map Compilations and Thematic Assessment Results*, mobilized resources to develop software for flood impact analysis and loss assessment, for evacuation analysis, and for flood risk mapping, strengthened technical guidance and training to ensure the quality of results; and mobilized resources to develop a submission system for flood risk map compilations and a system for real-time simulation and dynamic display of flood risks to enhance the management and application of flood risk map submissions.

5.6 防洪“四预”能力提升

水利部以数字孪生流域建设成果为基础，强化“天空地水工”一体化监测感知能力，夯实防洪“四预”数据底板，构建智能专业模型。组织七个流域管理机构汛前开展了汉江、澧水、伊洛河、大汶河、史灌河、渭河、漳河、大清河、北江、汀江、洮儿河、梧桐河、太浦河、钱塘江 14 条河流水系防洪“四预”能力提升建设，有力支撑了 2025 年汉江“最密集秋汛”、澧水第 1 号洪水、钱塘江第 1 号洪水、台风“蝴蝶”“竹节草”“桦加沙”“博罗依”“麦德姆”等引发暴雨洪水防御工作，并积累了可复制、可推广的经验。

5.6 Enhancement of the “Four Preemptive” Capabilities for Flood Control

Building on the achievements of digital twin for river basins, the MWR has continued to strengthen the integrated “space-air-ground-water-project” monitoring and sensing system, consolidated the data infrastructure supporting the four preemptive capabilities for flood control, and developed intelligent specialized models. Prior to the flood season, the Ministry organized the seven river basin authorities to carry out such capability enhancement projects covering 14 rivers—Hanjiang, Lishui, Yiluo, Dawen, Shiguan, Pihe, Zhanghe, Daqing, Beijiang, Tingjiang, Tao'er, Wutong, Taipu, and Qiantang rivers. These efforts provided strong support for flood defense operations during the most frequent autumn flood period on the Hanjiang, No. 1 flood on the Lishui River, No. 1 flood on the Qiantang River, and rainstorms and floods triggered by typhoons Wutip, Co-may, Ragasa, Bualoi, and Matmo, and helped the generation of replicable experiences for future situations.

表 5-1 2025 年防洪“四预”能力提升试点河流
Table 5-1 Pilot rivers for the 2025 four preemptive capabilities enhancement initiative
for flood control

流域 Basin	试点河流 Pilot rivers
长江 The Yangtze River	汉江、澧水 Hanjiang, Lishui
黄河 The Yellow River	伊洛河、大汶河 Yiluo, Dawen
淮河 The Huaihe River	史灌河、淝河 Shiguan, Pihe
海河 The Haihe River	漳河、大清河 Zhanghe, Daqing
珠江 The Pearl River	北江、汀江 Beijiang, Tingjiang
松辽 The Songhua-Liaohe River	洮儿河、梧桐河 Tao'er, Wutong
太湖 The Taihu Lake	太浦河、钱塘江 Taipu, Qiantang

附录1
APPENDIX
1

典型水旱灾害 防御案例

REPRESENTATIVE CASES OF
FLOOD AND DROUGHT DISASTER
PREVENTION

案例 1

科学防御汉江“最密集秋汛”

2025 年 8 月 25 日至 10 月 20 日，长江、汉江发生明显秋汛，9 月 5 日、19 日、23 日、29 日和 10 月 3 日、13 日、18 日，汉江上游先后形成 7 次编号洪水，遭遇了 1961 年有实测资料以来最密集秋汛，丹江口水库累计来水量 307 亿立方米，为 1969 年建库以来同期第 2 位。国家防总副总指挥、水利部部长李国英先后 4 次主持会商（其中国庆中秋假期连续 2 次会商），滚动部署汉江秋汛防御和汛末蓄水工作，强调要坚持系统观念，统筹上下游、左右岸、干支流，滚动预报、滚动推演，科学调度以丹江口水库为核心的汉江流域水库群，确保汉江中下游防洪安全，全力避免汉江中下游发生超警洪水。精准掌握库区 170 米高程以下人员分布、污染源等风险因素，提前通知相关地区采取措施，“一个流量、一方库容、一厘米水位”精细调度，确保实现丹江口水库蓄至正常蓄水位 170 米目标。水利部坚持 24 小时值班值守，每日持续滚动会商，“一省一单”精准靶向预警，及时启动洪水防御Ⅳ级应急响应。长江委坚持旱涝同防同治，科学调度以丹江口水库为核心的汉江流域控制性水库群，取得了汉江“最密集秋汛”防御和汛末蓄水的全面胜利。

一是统筹上下游、左右岸、干支流，加强汉江流域水库群统一联合调度。汉江第 1～3 号洪水期间，综合考虑防洪安全和水库群回蓄，联合调度汉江上游控制性水库群全面拦洪，共计拦洪 97.01 亿立方米，其中丹江口水库拦洪 73.34 亿立方米，将最大入库洪峰流量 19600 立方米每秒削减至 1450 立方米每秒下泄，削峰率达 93%，最大降低汉江中下游皇庄、仙桃站水位 8.32 米、11.26 米，避免了皇庄河段超警戒水位、仙桃至汉川河段超保证水位，以及杜家台蓄滞洪区及中下游分蓄洪民院启用。汉江第 4 号、5 号洪水期间，统筹丹江口库区和中下游防洪安全，汉江上游控制性水库群拦洪 51.44 亿立方米，其中丹江口水库拦洪 38.69 亿立方米，最大降低汉江中下游皇庄、仙桃站水位 3.06 米、3.49 米，全力避免了汉江中下游干流超警。汉江第 6 号、7 号洪水期间，以库区不淹没、汉江中下游干流不超警为目标，在保障防洪安全的前提下结合洪水退水过程开展蓄水，汉江上游控制性水库群拦洪 25.77 亿立方米，其中丹江口水库拦洪 15.58 亿立方米，最大降低汉江中下游皇庄、仙桃站水位 2.59 米、2.73 米。在 7 次编号洪水应对中，汉江上游水库群累计拦洪 174 亿立方米，其中丹江口水库拦洪 127 亿立方米，极大地减轻了汉江中下游地区的防洪压力，累计减淹耕地 86.67 千公顷，避免转移人口约 51 万人，减少经济损失约 122 亿元，有效保障了人民群众生命财产安全和流域防洪安全。

二是充分发挥数字孪生汉江“四预”功能，全力避免库区淹没和汉江中下游发生超警洪水。水利部统筹兼顾中下游防洪、库区淹没防控与洪水资源利用三重目标，深化数字孪生长江建设成果运用，依托“天空地水工”一体化监测感知体系，精准掌控汉江流域雨、水情动态；通过天气数值预报、天气雷达和水利测雨雷达监测、水文模型推演等工作，将来水预测周期从 7 天延长至

10 天；借助数字孪生长江智慧防洪抗旱系统，动态模拟预演汉江流域骨干工程调度和洪水演进 80 余次，充分利用汉江防洪“四预”系统，滚动研判丹江口库区淹没和汉江中下游超警风险，比选确定最优调度策略，努力让防御措施跑赢暴雨洪水。长江委利用无人机航拍与人工巡查相结合，精准掌握丹江口库区水位 170 米及征地线、移民线以下人员分布等风险因素。10 月 6 日，丹江口水库水位已达 169.50 米左右，汉江上游水库群几近蓄满，根据未来洪水预报，汉江第 6 号洪水可能在几天内形成，并且之后汉江上游仍有降雨过程，丹江口库区面临淹没风险。长江委利用数字孪生长江智慧防洪抗旱系统连续比对多套方案，确定“预泄腾库、拦洪错峰”调度策略，调度丹江口水库自 10 月 6 日 12 时起下泄流量最大增加至 9100 立方米每秒，将丹江口水库水位提前降至 168.76 米，有效化解了库区淹没风险，保障了库区人民群众生命财产安全；在确保库区安全的前提下，统筹兼顾汉江中下游防洪安全，调度丹江口水库自 10 月 14 日起逐步减小下泄流量，成功错开丹江口下游丹皇区间洪峰，实现库区不淹没、中下游不超警，同时保障后续蓄水的调度目标。

三是坚持旱涝同防同治，实现丹江口水库蓄满目标。水利部统筹秋汛防御和汛末蓄水，在确保防洪安全的同时，联合调度流域水库群，精准控制丹江口水库出库流量和梯级水库蓄水进程，同时加大南水北调中线和清泉沟供水流量，充分利用洪水资源发挥综合效益。汉江第 6 号、7 号洪水期间，结合“10 月下旬汉江流域降雨将明显减少”的预测，调度丹江口水库在最后一轮洪水过峰后，利用尾洪于 10 月 18 日 8 时将库水位第三次蓄至 170 米正常蓄水位，为下年度向汉江中下游及南水北调中线沿线地区供水提供坚实保障，汉江秋汛防御与汛后蓄水取得双胜利。

Case 1

Scientific response to the most frequent autumn flood period on the Hanjiang

From August 25 to October 20, 2025, the Yangtze River and Hanjiang River experienced significant autumn floods. On September 5, 19, 23, and 29, and on October 3, 13, and 18, seven numbered floods formed in the upper Hanjiang, marking the most frequent autumn floods period since measurements began in 1961. The Danjiangkou Reservoir received a cumulative inflow of 30.7 billion m^3 , the second-highest for the same period since the reservoir's construction in 1969. Li Guoying, Vice Commander-in-Chief of the SFDH and Minister of Water Resources, presided over four consultation meetings (working through two public holidays) to roll out measures for flood control and water storage when nearing the end of the flood season. He emphasized the need to adopt a systematic approach, coordinating efforts across upstream and downstream areas, both banks, and mainstream and tributaries; rolling forecasts and simulations were conducted; the reservoir group on the Hanjiang—centered on the Danjiangkou Reservoir—were operated to ensure flood safety in the middle and lower reaches of the Hanjiang and to make every effort to prevent flood levels from exceeding warning thresholds in those areas. Risk factors, such as the distribution of people and pollution sources below the 170-meter elevation in the reservoir area, were identified, and relevant regions were notified in advance to take measures, and precise dispatch per unit of flow, storage capacity, and water level was enabled to ensure the Danjiangkou Reservoir reached its normal storage level of 170 m. The MWR maintained a 24/7 duty system, held daily rolling consultations, issued precise, targeted early warnings to each province, and promptly activated a Level IV flood control emergency response. The Changjiang Commission made efforts to both control floods and utilize floodwater, dispatching the reservoir group in the Hanjiang basin centered on the Danjiangkou Reservoir to defend the most frequent autumn flood period and also achieve satisfying results in reservoir impoundment at the end of the flood season.

First, by coordinating considerations for upstream and downstream, left and right banks, and main and tributary rivers, the unified and joint dispatch of the Hanjiang reservoir group was strengthened. During the No. 1-No. 3 floods on the Hanjiang, consideration was given to both flood safety and reservoir replenishment, and the upstream control reservoir group on the Hanjiang was scheduled to intercept floodwater at full capacity, holding back 9.701 billion m^3 of floodwater. The Danjiangkou Reservoir alone retained 7.334 billion m^3 , receiving 19,600 m^3/s of peak inflow while discharging at 1,450 m^3/s of outflow, achieving a peak reduction rate of 93%. Water levels at the Huangzhuang and Xiantao stations in the middle and lower reaches of the Hanjiang were lowered by 8.32 m and 11.26 m, respectively. This prevented the Huangzhuang river section from exceeding the warning level and the Xiantao to Hanchuan river section from exceeding the guaranteed level, and averted the activation of the Dujiatai flood detention area and flood detention polders in the middle and lower reaches. During the No. 4 and No. 5 floods on the Hanjiang, flood safety of the Danjiangkou Reservoir area and the middle and lower reaches was coordinated. The reservoir group in the upper Hanjiang retained 5.144 billion m^3 of floodwater, of which the Danjiangkou Reservoir retained 3.869 billion m^3 . Water levels at Huangzhuang and Xiantao stations were reduced by 3.06 m and 3.49 m, respectively, and every effort was made to keep the

mainstream of the middle and lower Hanjiang from swelling beyond the warning level. During the No. 6 and No. 7 floods on the Hanjiang, the objectives were set as to prevent reservoir area inundation and keep water levels in the middle and lower reaches of the Hanjiang mainstream below warning levels. Water storage operations were conducted in conjunction with the flood receding process while ensuring flood safety. The reservoir group in the upper Hanjiang retained 2.577 billion m^3 of floodwater, of which the Danjiangkou Reservoir retained 1.558 billion m^3 . Water levels at the Huangzhuang and Xiantao stations were reduced by 2.59 m and 2.73 m, respectively. In response to the seven numbered floods the upper Hanjiang reservoir group retained 17.4 billion m^3 of floodwater in total, with the Danjiangkou Reservoir alone retaining 12.7 billion m^3 . This significantly alleviated flood control pressure in the middle and lower Hanjiang, protecting 86,670 ha of farmland from being flooded, sparing approximately 510,000 people from being evacuated, and reducing economic losses by about 12.2 billion RMB. The lives and property as well as the flood safety of the river basin were guaranteed.

Second, the four preemptive capabilities of Hanjiang digital twin were harnessed to prevent reservoir inundation and above-warning level flooding in the middle and lower reaches. The MWR coordinated the three objectives of flood control in the middle and lower reaches, prevention of reservoir area inundation, and utilization of flood resources. It carried forward the application of the Digital Twin Yangtze River project and, relying on an integrated “space-air-ground-water-project” monitoring and sensing system, precisely tracked rainfall and hydrological dynamics in the Hanjiang River basin. Through numerical weather forecasting, weather radar and hydrological rain radar monitoring, and hydrological model simulations, the forecast lead time for inflows was extended from 7 to 10 days. Utilizing the Digital Twin Yangtze River Smart Flood Control and Drought Relief System, over 80 dynamic simulations of key project dispatch and flood evolution were conducted. By fully leveraging the Hanjiang flood control four preemptive capabilities system, the risks of inundation in the Danjiangkou Reservoir area and flooding above warning levels in the middle and lower reaches were assessed, the optimal dispatch strategies were compared and selected, and responses stayed ahead of rainstorms and floods. The Changjiang Commission combined drone photography with manual patrols to accurately identify risk factors, including the distribution of people below the 170-meter water level mark in the Danjiangkou Reservoir area, as well as below the land acquisition and resettlement lines. By October 6, the Danjiangkou Reservoir swelled to approximately 169.5 m, and the reservoir group in the upper Hanjiang were nearly full. Based on flood forecasts, the No. 6 flood was expected to form within a few days, and additional rainfall processes were anticipated in the upper Hanjiang, meaning that the Danjiangkou Reservoir area faced inundation. The Changjiang Commission utilized the Digital Twin-based Yangtze River Smart Flood Control and Drought Relief System to compare multiple scenarios and determined the optimal strategy as “pre-release to create storage capacity and flood retention and peak shifting”. Starting at 12:00 on October 6, the outflow from Danjiangkou Reservoir was increased to a maximum of 9,100 m^3/s , lowering the reservoir level to 168.76 m ahead of schedule. This effectively mitigated the risk of reservoir area inundation and safeguarded the lives and property of the local population. While ensuring the safety of the reservoir area, flood safety in the middle and lower reaches

was taken into consideration. Starting on October 14, the outflow from Danjiangkou was gradually reduced, successfully staggering the flood peaks in the Danhuang section downstream of Danjiangkou. This achieved the goals of preventing inundation in the reservoir area and keeping water levels below warning levels in the middle and lower reaches, while ensuring subsequent water storage objectives.

Third, the principle of equal attention to flood and drought prevention and control was established and the goal of filling the Danjiangkou Reservoir to full storage was realized. The MWR coordinated autumn flood defense with end-of-flood-season water storage. While ensuring flood safety, it jointly managed the reservoir group in the basin, precisely controlling the outflow from the Danjiangkou Reservoir and the water storage process of the cascade reservoirs. At the same time, the water supply flow through the Middle Route of the South-to-North Water Diversion Project and the Qingquangou Water Supply Project was increased to harness flood resources. During the No. 6 and No. 7 floods on the Hanjiang, as the forecast showed significant decrease of rainfall in the basin in late October, Danjiangkou Reservoir was scheduled to harness the remaining floodwater after the final flood peak passed. At 8:00 on October 18, the reservoir water level was raised for the third time to the normal storage level of 170 m, providing a solid guarantee for water supply to the middle and lower reaches of the Hanjiang and areas along the Middle Route of the South-to-North Water Diversion Project in the coming year. The fight against the River's autumn floods and the goal of post-flood water storage were successful.

案例 2

践行“洪水控制、洪水利用、洪水塑造”理念，推进黄河防汛工作高质量发展

2025 年 9 月至 10 月中旬，黄河流域秋雨过程持久密集，其中 10 月上中旬累计降雨量较常年同期偏多近 4 倍。受密集秋雨过程影响，黄河 10 月 12 日 23 时形成 2025 年第 1 号洪水。面对复杂严峻的防汛形势，黄委按照水利部统一部署，践行“洪水控制、洪水利用、洪水塑造”理念，每日滚动会商研判，加密监测预报预警，科学精细实施流域水工程多目标调度，充分发挥水工程综合效益。

一是全力抓好洪水控制，有效防御黄河秋汛。黄河第 1 号洪水期间，联合调度以小浪底水库为核心的黄河中游水库群拦洪削峰错峰，三门峡水库按 6500 立方米每秒下泄直至敞泄，避免顶托渭河洪水；小浪底水库适当压减下泄流量，按 1500 立方米每秒控泄，陆浑、故县、河口村等水库按照不超过正常蓄水位控泄，将花园口天然状况下 6900 立方米每秒的洪峰流量削减至 2670 立方米每秒，削峰率达 61.3%，确保黄河下游滩区不漫滩、各类防洪工程安全平稳运行。

二是统筹抓好洪水利用，实现汛末满蓄目标。在确保防汛安全的前提下，统筹灌溉、蓄水、发电等需求，抓住秋汛来水的有利时机，有序开展汛末骨干工程蓄水，黄河中游三门峡、小浪底、陆浑、故县、河口村等水库和东平湖汛末总蓄水量 105.5 亿立方米，为常年同期第二高，其中小浪底水库水位蓄至 270.20 米，蓄水量 79.7 亿立方米，为常年同期最高。

三是切实抓好洪水塑造，科学实施水沙调控。9 月 17 日至 10 月 25 日，结合秋汛防御和水沙调控需求，联合调度三门峡、小浪底、陆浑、故县和河口村五库实施 2025 年汛期第二次调水调沙，三门峡水库视上游来水情况适时敞泄运用，考虑伊洛河、沁河等来水，小浪底水库按控制花园口站流量不超过 3000 立方米每秒运用，利用洪水天然动能冲刷河道降低潼关高程 0.50 米左右，三门峡水库排沙 1.145 亿吨，小浪底水库排沙 0.165 亿吨，下游河道冲刷泥沙 0.418 亿吨，利津站入海沙量 0.571 亿吨，水沙调控成效显著。

Case 2

Advancing sound flood control work in the Yellow River Basin under the concept of “flood control, floodwater utilization, and for-purpose flood pulse recreation”

From September to mid-October 2025, the Yellow River Basin experienced prolonged and frequent autumn rainfall, with cumulative rainfall in early to mid-October nearly four times more than normal. Affected by the frequent autumn rains, the Yellow River's 2025 No. 1 flood formed at 23:00 on October 12. In the face of the complex and severe flood situation, the

Yellow River Commission followed the unified deployment of the MWR and focused on “flood control, floodwater utilization, and for-purpose flood pulse recreation”. It conducted daily rolling consultations and assessments, stepped up monitoring, forecasting, and early warning efforts, and implemented scientific and precise multi-objective scheduling of water projects across the basin to fully leverage the benefits of these facilities.

First, on flood control: every effort was made to effectively defend against the autumn flood on the Yellow River. During the No. 1 flood, a joint dispatch operation of the reservoir group in the middle reaches of the Yellow River, centered on the Xiaolangdi Reservoir, was implemented to intercept, reduce, and stagger the flood peaks. The Sanmenxia Reservoir’s outflow was raised to 6,500 m³/s until it reached full discharge capacity to avoid the backwater effect that would affect the flood discharge on the Weihe River. Xiaolangdi Reservoir’s outflow was moderately reduced to 1,500 m³/s, the Luhun, Guxian, and Hekoucun reservoirs maintained such discharge volumes so that they were not breaking normal storage levels, thereby reducing the peak flood flow at Huayuankou from 6,900 m³/s under natural conditions to 2,670 m³/s (peak reduction rate 61.3%). This spared the floodplains in the lower reaches from inundation and ensured the safe and stable operation of all flood control structures.

Second, on floodwater utilization: The goal of full reservoir storage by the end of the flood season was achieved. While ensuring flood safety, the needs of irrigation, water storage, and power generation were coordinated. Seizing the time window presented by the autumn flood inflows, water storage operations at key projects were organized by the end of the flood season. The total end-of-flood season storage volume in the middle reaches of the Yellow River—including Sanmenxia, Xiaolangdi, Luhun, Guxian, and Hekoucun reservoirs, as well as Dongping Lake—reached 10.55 billion m³, the second-highest on record for this time of year. Among these, the Xiaolangdi Reservoir reached a water level of 270.20 m with a storage volume of 7.97 billion m³, the highest on record for this time of year.

Third, on for-purpose flood pulse recreation: Water and sediment regulation was scientifically conducted. From September 17 to October 25, to realize the dual objectives of autumn flood prevention and water-sediment regulation, the five reservoirs—Sanmenxia, Xiaolangdi, Luhun, Guxian, and Hekoucun—were jointly operated to carry out the second water-sediment regulation of the 2025 flood season. Sanmenxia timely opened all its gates for full release based on upstream inflow conditions; taking into account inflows from the Yiluo River and Qinhe River, Xiaolangdi was operated to keep the flow at the Huayuankou Station under 3,000 m³/s and utilized the natural kinetic energy of the floodwaters to scour the riverbed and lower the elevation at Tongguan section by approximately 0.50 m. Sanmenxia Reservoir flushed down 114.5 million tons of sediment, Xiaolangdi Reservoir 16.5 million tons, and another 41.8 million tons from downstream river channels, while 57.1 million tons of sediment entered the sea via Lijin Station. These operations improved significant success in water and sediment regulation.

案例 3 科学防御海河流域“25·7”区域性大洪水

2025年7月，海河流域中北部降雨量打破1961年有实测记录以来同期最多的纪录，继2023年流域性特大洪水后再次发生区域性大洪水，流域过程降雨总量278亿立方米，仅次于海河“63·8”“96·8”“23·7”三次流域性洪水，12条河流发生超历史洪水，密云水库2天内出现2次超历史入库洪水。国家防总副总指挥、水利部部长李国英3次主持专题会商，逐河系有针对性地安排部署洪水防御工作，赴北京防汛一线指导抗洪抢险。

一是提前安排部署，及时启动响应。根据预报信息，水利部启动防汛关键期工作机制，逐日滚动会商研判，提前4天预报海河流域北部诸河将发生超警以上洪水，有针对性地部署防御措施。7月27日针对北京等省（直辖市）启动洪水防御Ⅳ级应急响应，28日将应急响应提升至Ⅲ级。

二是滚动分析研判，强化监测预警。充分利用雨水情监测预报“三道防线”，累计发布1251条测雨雷达短临暴雨预警、404次临近暴雨预警、205次临近强降雨风险自动预警、11071站（次）洪水预报和47次洪水预警信息，预警信息直达14.65万人（次）。

三是科学精细调度，确保防洪安全。水利部、海委指导京津冀水利部门科学实施水库群联合调度，有效防御北三河大洪水。76小时内11次动态调度潮白河密云水库下泄流量，最大削峰率达99%，水库水位运用至建库以来最高；协调优化调度北运河北关枢纽充分利用北运河下泄洪水，压减怀柔、北台上、大水峪等7座水库下泄流量共计290立方米每秒，成功避免黄庄洼蓄滞洪区启用；联合调度洵河海子、黄松峪、西峪和杨庄水库，最大限度削减蓟运河上游洵河超历史实测记录洪峰，有效避免下游河北三河市城区段洪水漫溢。统筹实施南北支调度，有效防御大清河较大洪水。北支新盖房枢纽洪峰流量2次突破700立方米每秒，动态调控安格庄水库下泄流量，关键时刻闭闸错峰，科学调度新盖房枢纽，通过白沟引河、老大清河、新盖房分洪道主槽及中亭河分泄北支洪水，2次避免东淀蓄滞洪区启用；南支上游王快、龙门等5座大型水库全力拦洪削峰，枣林庄枢纽加大下泄，承接北支白沟引河洪水，白洋淀最高水位控制在7.17米，确保了雄安新区防洪安全。开展水库梯级调度，有效防御滦河2025年第1号洪水。降雨来临前，潘家口水库、大黑汀水库抢抓窗口期预泄腾库；洪水过程中，调度潘家口水库全力拦洪，削峰率超90%；大黑汀水库下泄流量逐级提至1800立方米每秒并稳定维持，在确保下游河道行洪安全的前提下逐步降低库水位，为迎战澈河洪水预留充足库容；澈河洪峰过后，潘家口水库逐级加大泄量至1750立方米每秒，与大黑汀水库形成梯级配合，顺利宣泄滦河洪水入海。

四是严密巡查防守，加强一线指导。水利部先后派出7个工作组、专家组，督促指导地方落实水库大坝、江河堤防等巡查抢险责任、人员、料物、设备。京津冀晋各级水利部门派出技术专家到一线指导查险抢险，组织75.4万人巡堤查险，及时处置险情487处，确保了堤防安全。

Case 3

Scientific flood control of the “July 2025” regional large flood in the Haihe River Basin

In July 2025, rainfall amounts in the central and northern parts of the Haihe River Basin broke the post-1961 record over the same period. A large regional flood occurred following the extreme flood in 2023. The total precipitation volume during the event reached 27.8 billion m^3 , second only to the three historic floods of “August 1963,” “August 1996,” and “July 2023”. Twelve rivers experienced record-breaking floods, and the Miyun Reservoir recorded two instances of record-breaking inflows within two days. Li Guoying, Vice Commander-in-Chief of the SFDH and Minister of Water Resources, presided over three dedicated consultation meetings to make targeted flood control arrangements detailed to each affected river system, and went to the front lines in Beijing to guide on-site flood control and rescue.

First, on advance planning and timely responses: Based on forecasts, the MWR activated the working mechanism for the critical flood control period, conducting daily rolling consultations and assessments. The forecast of above-warning level floods in the northern rivers of Haihe basin was made four days ahead of the event, winning time for targeted responses. On July 27, a Level IV emergency response for flood control was activated for Beijing and other affected provinces/municipalities, and the response was elevated to Level III on the 28th.

Second, on rolling analysis and assessment to strengthen monitoring and early warning: The three lines of defense (satellites, radars, ground stations) for rainfall and hydrological monitoring and forecasting were effectively used, with 1,251 alerts for short-term imminent rainstorms, 404 alerts for imminent rainstorms, and 205 automatic alerts for imminent heavy rainfall risks based on rain radars, and 11,071 flood forecasts and 47 flood alerts issued via stations. These early warnings reached 146,500 people cumulatively.

Third, on scientific and precise scheduling to ensure flood safety: The MWR and the Haihe Commission guided water resources departments in the Beijing-Tianjin-Hebei region to scientifically operate the reservoir group so as to defend the large flood in Beisan (northern three) rivers. Within 76 hours, the outflow from Miyun Reservoir on the Chaobai River was adjusted 11 times to achieve a maximum peak reduction rate of 99%, with the reservoir water level reaching its highest level since its construction. The Beiyun River Beiguan complex was operated to fully utilize the flood discharge through the Beiyun River and reduce the outflows of seven reservoirs—including Huairou, Beitashang, and Dashuiyu—by a cumulative total of 290 m^3/s , successfully averting the activation of the Huangzhuangwa flood detention area. The Haizi, Huangsongyu, Xiyu, and Yangzhuang reservoirs on the Juhe River were scheduled to forcefully reduce the record-breaking flood peak on the upper Jiyun River, effectively preventing inundation in the urban parts of Sanhe City, Hebei Province, downstream. The scheduling of northern and southern branches was coordinated to effectively control a medium flood on the Daqing River. The peak flow at the Xingtaifang complex on the North Branch exceeded 700 m^3/s twice; in response to this situation, the outflow from Angezhuang Reservoir was dynamically adjusted and the gates were closed at critical moments to stagger peak flows; the Xingtaifang complex was scientifically

scheduled and floodwaters from the North Branch were diverted via the Baigou Diversion Channel, the Daqing River (old), the main flood diversion channel of the Xingtaifang and the Zhongting River, thereby preventing the activation of the Dongdian flood detention area on these two occasions. Upstream on the South Branch, five large reservoirs—including Wangkuai and Longmen—were operated at full capacity to intercept and reduce flood peaks. The Zaolinzhuang complex increased the outflow to receive floodwaters from the Baigou Diversion Channel on the North Branch, keeping the maximum water level in Baiyangdian Lake at 7.17 m and ensuring flood safety for the Xiong'an New Area. Cascade reservoir scheduling was utilized to defend the 2025 No. 1 flood on the Luanhe River. Prior to the onset of rainfall, the Panjiakou and Daheiting reservoirs timely conducted pre-release and created storage capacity; during the flood event, Panjiakou Reservoir was scheduled to retain floodwaters at full capacity, achieving a peak flow reduction rate exceeding 90%; the outflow from Daheiting Reservoir was gradually increased to and maintained at 1,800 m³/s, and then was gradually lowered under the premises of flood discharge safety in downstream river channels, thereby reserving sufficient storage capacity to prepare for the Sahe River flood; After the flood peak on the Sahe River passed, Panjiakou Reservoir gradually increased its discharge to 1,750 m³/s in tandem with Daheiting Reservoir, thereby successfully discharging the Luanhe River floodwaters into the sea.

Fourth, on rigorous patrols and front-line guidance: The MWR dispatched seven working groups and expert teams to supervise and guide local authorities in fulfilling their responsibilities for patrols and emergency response at reservoirs, dams, and river embankments, ensuring adequate personnel, materials, and equipment. Local water resources departments in Beijing, Tianjin, Hebei, and Shanxi dispatched technical experts to the front lines to guide hazard identification and emergency response efforts. A total of 754,000 people were mobilized to patrol embankments and inspect for hazards, and 487 critical situations were promptly addressed, ensuring the safety of the embankments.

案例 4

成功处置大黑河美岱沟洪水险情

2025 年 7 月 23 日至 8 月 29 日，内蒙古大黑河、美岱沟流域连续发生 6 次强降雨过程。受强降雨过程影响，内蒙古哈素海水库水位长时间超校核洪水位，哈素海退水渠和大黑河堤防发生多处溃口，重要保护对象被洪水围困，哈素海退水渠入黄闸超设计工况运行，防汛形势异常严峻。中央领导同志高度重视并多次作出重要指示批示，水利部和地方政府按照党中央、国务院决策部署，迅即启动应急响应，切实采取有力措施，实现“人员不伤亡、哈素海水库不垮坝、黄河大堤不决口、重要保护对象不受冲击”的目标。

一是科学研判，切实加强技术指导。国家防总副总指挥、水利部部长李国英先后 5 次召开专题会商会，研究部署应急处置工作，并于 8 月 18—20 日赴一线调研指导，提出“排水、监测、固守、效率”的应对策略。水利部针对内蒙古自治区启动洪水防御Ⅲ级应急响应，逐日会商研判险情形势，派出工作组、专家组和水文应急监测队（高峰时支前队伍共 60 余人）赴一线全程协助指导，前后方密切配合、协调联动、科学研判，及时对应急处置工作提出意见建议，指导督促地方政府及有关单位落实落细各项防御措施。

二是多措并举，圆满完成险情处置。内蒙古自治区成立前线指挥部，由自治区政府常务副主任任组长，统筹指挥险情处置工作，采取尽快封堵大黑河和退水渠溃口、加强堤防巡查防守和险情抢护、开辟临时蓄滞洪区分滞洪水、布设强排设备降低重要保护对象围堤外水位、加固重要保护对象围堤和退水渠左堤等措施，确保了重要保护对象安全。通过采取精细调度哈素河流域水工程、实施强排降低水库水位、加强哈素海水库堤坝巡查防守等措施，确保了哈素海水库安全。通过采取尽快降低哈素海退水渠入黄闸闸前水位、修筑戽台加固黄河大堤等措施，及时消除黄河大堤安全风险。通过持续拓宽哈素海退水渠下游段卡口、加强大黑河入黄闸上下游清淤除障等措施，加快水流下泄入黄河，减轻全流域洪水风险。

三是科技赋能，发挥技术支撑作用。水利部门临时新增 33 处水文应急监测站点，采用无人船搭载测流仪、雷达测速枪等设备，加强水域水文监测；利用卫星遥感影像，滚动编发遥感监测分析报告，动态掌握水域及淹没范围变化、堤防溃口发展等情况；利用新型多功能无人机开展巡测，加密监测水库围堤和退水渠堤防工程安全；构建数值模型，快速推演洪水演进、淹没范围、分洪水量及受影响村庄等关键要素，形成分洪与退水方案；利用探地雷达和瞬变电磁物探技术装备开展探测，研判哈素海水库大坝、黄河大堤等内部风险；运用无人船精准测绘水下地形，精准识别阻水区域，为应急处置提供科学依据。

Case 4

Successful management of the critical flood situation in Meidaigou and Dahei river basins

From July 23 to August 29, 2025, the Daheihe River and Meidaigou River basins in Nei Mongol experienced six consecutive episodes of heavy rainfall. As a result, the water level at Hasuhai Reservoir in Nei Mongol rose above the check flood level and remained so for an extended period. Multiple breaches occurred in the Hasuhai drainage channel and the Daheihe embankments, leaving key protected facilities surrounded by floodwaters. The Hasuhai drainage channel's gate connecting to the Yellow River operated beyond its design capacity, creating a severe flood control situation. The Central government attached great importance to the situation and issued multiple important instructions. In accordance with the central decisions and arrangements, the MWR and local governments immediately activated emergency response measures. These measures proved effective in realizing the goal of zero casualties, no collapse of the Hasuhai Reservoir, no breaches in the Yellow River embankments, and no disruption to key protected facilities.

First, on scientific assessment and strengthened technical guidance: Li Guoying, Vice Commander-in-Chief of the SFDH and Minister of Water Resources, convened five dedicated consultation meetings to deploy emergency responses. From August 18 to 20, he visited the front lines to research the situation on-site, proposing a response strategy centered on “drainage, monitoring, ensuring no dam breach, and efficiency.” The MWR activated a Level Ⅲ flood control emergency response for the Nei Mongol Autonomous Region, conducting daily consultations to assess the situation. It dispatched working groups, expert teams, and hydrological emergency monitoring teams (with a total of over 60 personnel at peak times) to the front lines to provide consistent assistance and guidance. Through close coordination and scientific analysis, the Ministry promptly offered recommendations for emergency response and guided and urged local implementation.

Second, on taking a multi-pronged approach to hazard removal. The Nei Mongol Autonomous Region established a frontline command center, led by the Executive Vice Chairman of the Government of the Region, to coordinate and direct the response to the emergency. Measures included promptly sealing breaches on the Dahei River and the drainage channel, strengthening patrols and emergency repairs, creating temporary flood detention areas to divert floodwaters, deploying emergency drainage equipment to lower waters surrounding the key protected sites, and reinforcing the embankments of key protected sites and the left bank of the drainage channel. These actions ensured the safety of key protected sites. Through precise scheduling of water control projects in the Hasuhai basin, implementing forced emergency drainage to lower reservoir water levels, and strengthening patrols on Hasuhai embankments, the safety of the Hasuhai reservoir was ensured. By rapidly lowering the water level upstream of the gates to the Yellow River of the Hasuhai drainage channel and constructing buttresses to reinforce the Yellow River embankment, safety risks to the Yellow River embankment were promptly eliminated. Through continuous widening of blocked sections in the downstream section of the Hasuhai drainage channel and dredging and obstacle removal upstream and downstream of the Dahei River's Yellow River inlet gates, water discharge into the Yellow River was accelerated, thereby mitigating flood risks across the entire basin.

Third, on leveraging technology to provide concrete support: Water resources authorities established 33 temporary emergency hydrological monitoring stations, utilizing unmanned vessels equipped with current meters and radar speed guns to enhance hydrological monitoring of water bodies; leveraging satellite remote sensing imagery to continuously compile and issue monitoring analysis reports, thereby dynamically tracking changes in water levels, inundation areas, and the development of levee breaches; and deploying new multi-functional drones for patrols to intensify monitoring of the safety of reservoir embankments and drainage channel levees; developing numerical models to rapidly simulate key factors such as flood development, inundation areas, flood diversion volumes, and affected villages, thereby formulating flood diversion and drainage plans; using ground-penetrating radar and transient electromagnetic geophysical exploration equipment to conduct surveys and assess risks inside structures such as the Hasuhai Reservoir Dam and the Yellow River embankments; employing unmanned boats to conduct precise underwater topographic mapping and accurately identify water-blocking areas, providing a scientific basis for emergency response.

案例 5 湖南桃源县“测雨雷达 + 动态预警”支撑精准转移避险，实现山洪灾害“零伤亡”

2025 年 5 月 22 日凌晨，湖南省常德市桃源县牛车河镇遭遇罕见极端强降雨，龙凤山站 12 小时降雨量 447 毫米，突破当地气象记录极值。湖南省水利厅依托“省级部署、多级应用”架构的省级山洪灾害监测预报预警平台（简称“省级平台”）动态调整预警阈值，基于 X 波段测雨雷达分钟级降雨反演数据及时发布预警，提前转移 1350 户 3500 余人，实现山洪灾害“零伤亡”。

一是多级联动，精准锁定风险区域。5 月 21 日 18 时，水利部针对桃源县发布了山洪灾害黄色风险预警；21 时，湖南省水利厅升级发布山洪灾害橙色风险预警，指出常德市西部发生山洪灾害可能性大，市、县水利部门密切跟踪，精准研判山洪灾害风险落区，并向该区域群众发送靶向预警信息。

二是实时演算，调整降低预警阈值。依托测雨雷达追踪雨情，省级平台实时动态分析土壤含水量，结合牛车河镇地形、地质条件及降雨发展趋势，通过动态预警模型实时演算，将牛车河镇山洪灾害危险区 1 小时准备转移预警阈值由 50 毫米调整降低为 46.1 毫米。

三是雷达反演，及时发布转移预警。22 日 4 时，根据测雨雷达反演数据，牛车河镇未来 1 小时降雨 49.2 毫米，超过准备转移预警阈值（46.1 毫米），省级平台提前触发转移指令，并通过 AI 电话“叫应”县水利局，向县、镇、村三级责任人累计发送预警短信 116 条。

四是落实预案，果断组织群众转移。牛车河镇党委、政府根据应急预案，全体干部下沉一线，有序组织人员转移，对独居老人、留守儿童等特殊群体实施“一对一”转移安置。22 日 5 时，3500 余人全部转移至安置点。6 时洪峰过境，部分低洼地区房屋被淹，因转移及时，未发生人员伤亡。

Case 5

Hunan's Taoyuan County achieves zero casualties in flash floods through "rain radar + dynamic early warning" system that enabled precise evacuation

In the early hours of May 22, 2025, Niuchehe Town in Taoyuan County, Changde City, Hunan Province, experienced rare and extreme heavy rainfall. The 12-hour rainfall at Longfengshan Station reached 447 mm, surpassing the local meteorological record. Hunan Provincial Department of Water Resources, leveraging the provincial flash flood monitoring, forecasting, and early warning platform (hereinafter the "provincial platform")—which operates under a "provincial deployment, multi-level application" framework—dynamically adjusted early warning thresholds. Based on minute-by-minute rainfall inversion data from the X-band rain radar, the Department promptly issued warnings, enabling the early evacuation of over 3,500 people in 1,350 households, thereby achieving zero casualties from the flash flood disaster.

First, multi-level coordination was implemented to precisely identify risk areas. At 18:00 on May 21, the MWR issued a yellow alert for flash flood in Taoyuan County; at 21:00, the Hunan Provincial Department of Water Resources elevated the alert to an orange one, indicating a high probability of flash floods in the western part of Changde City. Municipal and county water resources departments closely monitored the situation, accurately assessed the exposure zones, and sent alert messages exactly to residents in those areas.

Second, real-time calculations were used to adjust and lower the early warning thresholds. Relying on the rain radar to track rainfall conditions, the provincial platform conducted real-time dynamic analysis of soil moisture content. Taking into consideration of the topography, geological conditions, and rainfall trends of Niuchehe Town, and utilizing a dynamic early warning model for real-time calculations, the threshold for issuing the one-hour evacuation-ready alert was lowered from 50 mm to 46.1 mm for the hazard zone in Niuchehe Town.

Third, radar inversion was used to promptly issue early warnings. At 4:00 on the 22nd, based on radar-derived precipitation data, the projected rainfall for Niuchehe Town over the next hour was 49.2 mm, exceeding the evacuation-ready alert threshold (46.1 mm). The provincial platform triggered an evacuation order in advance and used AI-powered phone calls to alert the County Water Resources Bureau, sending a total of 116 text alerts to responsible officials at the county, town, and village levels.

Fourth, contingency planning was implemented, and the evacuation was organized wasting no time. In accordance with the contingency plan, the town government deployed all officials to the front lines to organize the orderly evacuation of residents, providing "one-on-one" assistance to vulnerable groups such as elderly people living alone and left-behind children. By 5:00 on the 22nd, all 3,500-plus residents had been evacuated to shelters. The flood peak passed at 6:00, flooding some houses in low-lying areas; however, thanks to the timely evacuation, there were no casualties.

案例 6 浙江省开化县山洪“预报预警、监测预警、现地预警”梯次连发，成功避免人员伤亡

2025年6月8日，浙江省衢州市开化县遭受罕见强降雨，最大过程降雨量394毫米（何田乡燕溪站），最大1小时降雨量116毫米，强降雨导致何田乡、马金镇、齐溪镇等地暴发严重山洪灾害。浙江省水利厅依托“省级部署、多级应用”架构的省级山洪灾害监测预报预警平台（简称“省级平台”），梯次发布“预报预警、监测预警、现地预警”，有效开展临灾预警“叫应”，指导开化县成功转移受威胁群众120户233人，避免了人员伤亡。

一是基于预报预警启动应急响应。6月7日17时，浙江省水利厅先后向开化县发布山洪灾害橙色风险预警；开化县水利局迅速启动水旱灾害防御应急响应，经研判后向全县11个乡镇提级发布山洪灾害红色风险预警，并向有关乡镇发送风险提示单，督促指导基层落实责任，加强值班值守与巡查排险。

二是基于监测预警“叫应”乡镇村组。6月8日3时50分，省级平台监测到何田乡长池村关联雨量站燕溪站实测1小时降雨量达到34毫米，自动触发山洪灾害准备转移预警（阈值34毫米）；3时55分，燕溪站实测1小时降雨量达到42.5毫米，触发立即转移预警（阈值41毫米）。强降雨期间，省级平台共发布监测预警672次，发送预警短信33239条。收到预警信息后，开化县水利局及时电话“叫应”乡、村责任人，提醒乡政府组织各村落实好转移避险工作。

三是基于现地预警果断扩面转移。6月8日10时15分，何田乡长池村现地声光电预警设备监测水位5分钟上涨0.45米，县水利局立即电话“叫应”乡、村负责人。10时30分，河道水位15分钟上涨1.74米（即将达到准备转移水位线），何田乡果断采取扩面转移，将沿溪沟233人全部转移。12时25分，河道水位达到洪峰，超立即转移水位线1.07米，由于群众提前转移避险，成功避免了人员伤亡。

Case 6

Kaihua County in Zhejiang Province successfully avoided casualties from flash floods through a sequential operation of “forecast-based early warnings, monitoring-based early warnings, and field early warnings”

On June 8, 2025, Kaihua County in Quzhou City, Zhejiang Province, experienced unusually heavy rainfall, with maximum rainfall in a single event amounting to 394 mm (at Yanxi Station in Hetian Township) and a maximum one-hour rainfall reached 116 mm. The heavy rainfall triggered severe flash floods in Hetian Township, Majin Town, and Qixi Town. Relying on the provincial flash flood disaster monitoring, forecasting, and early warning platform (hereinafter the “provincial platform”), which operates under a “provincial deployment, multi-level application” framework, the Zhejiang Provincial Department of Water Resources issued early warnings based on forecast, early warning, and field observations in a sequential manner and effectively triggered emergency responses protocols. These efforts guided Kaihua County to successfully evacuate the 233 at-risk villagers (120 households) and avoid any casualties.

First, emergency response was initiated based on forecasts and early warnings. At 17:00 on June 7, the Zhejiang Provincial Department of Water Resources issued an orange early warning for flash floods in Kaihua County. The County Water Resources Bureau promptly activated emergency response. After assessment, the Bureau decided to issue red (higher than orange) early warnings for all 11 townships in the county and sent risk notifications to the relevant townships, urging and guiding local authorities to act on their responsibilities, strengthen on-duty monitoring, patrolling and risk removal.

Second, emergency responses were initiated for townships and villages based on monitoring and early warnings. At 3:50 on June 8, the provincial platform detected that the Yanxi Station—the rainfall station associated with Changchi Village in Hetian Township—recorded hourly rainfall of 34 mm, which automatically triggered an evacuation-ready alert for flash flood disasters (threshold: 34 mm); At 3:55, the recorded one-hour rainfall at Yanxi Station reached 42.5 mm, triggering an evacuation-now alert (threshold: 41 mm). During the heavy rainfall, the provincial platform issued a total of 672 early warnings and sent 33,239 text alerts. Upon receiving the early warning information, the County Bureau promptly called each of the responsible officials in the townships and villages, and emphasized to the township government about effective evacuation.

Third, evacuation was decisively expanded based on field early warnings. At 10:15 on June 8, the audio-visual electronic warning device installed in Changchi Village, Hetian Township detected a 0.45 m rise in water level over 5 minutes. The County Bureau immediately warned township and village officials by phone. By 10:30, the in-stream water level had risen by 1.74 m over 15 minutes (approaching the evacuation-ready alert threshold). Hetian Township decisively expanded the evacuation scope and relocated all 233 residents along the stream. At 12:25, the in-stream water level reached its peak, exceeding the evacuation-now threshold by 1.07 m; thanks to the residents’ early evacuation, casualties were avoided.

案例 7 汉江流域极端枯水应对

2025 年 1—7 月，汉江上游降雨持续偏少，来水量为 1956 年以来同期最枯，丹江口水库一度低于死水位运行，汉江流域及南水北调中线等相关方面供水安全受到威胁。水利部迅速启动应对丹江口水库低水位应急工作机制，国家防总副总指挥、水利部部长李国英先后 10 次主持专题会商，提出把丹江口水库水源区、受水区及相关区域作为一个整体，坚持系统思维、依法依规、统一调度，流域区域统筹，近期远期结合，开源节流并举，“一个流量、一方库容、一厘米水位”精准实施水工程统一联合调度，有力保障南水北调中线、汉江中下游和西安市供水安全。

一是强化“四预”措施，支撑水工程科学精准调度。利用“天空地水工”一体化监测感知体系，对汉江流域降雨、河道径流、水体水质、水库水位及上下游地区用水量等开展全要素实时监测，超前滚动研判丹江口水库低水位运行可能出现的各种风险，充分利用数字孪生丹江口技术平台逐日推演入库径流过程，精准开展水量供需平衡分析，为水工程调度提供有力支撑。

二是上补下控并举，实现丹江口水库水位止跌回升。充分挖掘汉江上游水库群补水潜力，有序实施安康、孤山、潘口、黄龙滩等汉江上游 19 座水库统一联合调度，累计向丹江口水库补水 17.9 亿立方米。优化丹江口水库运行调度，动态调整向南水北调中线、汉江中下游、襄阳引丹灌区和鄂北地区水资源配置工程等供水流量，指导相关地区强化节约用水，实现有限水源的最大效用。通过综合采取上补下控措施，及时遏制了丹江口水库水位持续下跌趋势，2025 年 5 月 30 日水位回升至 150.00 米，在汉江上游 6 月基本没有大的降雨过程情况下，丹江口水库水位保持在 150.00 ~ 150.20 米近 30 天。

三是流域区域统筹，确保各方供水安全。实施跨流域、跨区域、长距离水量调度，多线调剂补充水源。调度三峡水库 7—8 月下泄流量保持在 14000 立方米每秒以上，支撑引江济汉工程按不低于 400 立方米每秒大流量引水，以长江干流水源替换丹江口水库下泄减量；调度鸭河口、三里坪等汉江中游支流水库补水 0.95 亿立方米，保障汉江中下游城乡供水安全。阶段性加大向汉江中下游、襄阳引丹灌区和鄂北地区水资源配置工程供水量，保障秋粮作物时令灌溉用水。动态调整向南水北调中线供水流量，指导沿线地区加强水源调度，保障供水安全。精打细算调度引汉济渭工程持续向西安市跨流域调水，有力支持西安市渡过缺水难关。

Case 7

Response to extreme low waters in the Hanjiang River Basin

From January to July 2025, rainfall in the upper Hanjiang River basin remained persistently less than normal, resulting in the lowest inflow for that period since 1956. At one point, the Danjiangkou Reservoir operated below its dead storage level, threatening water supply security in the Hanjiang River basin and the Middle Route of the South-to-North Water Diversion Project. The MWR promptly activated the emergency response work mechanism for the depleted Danjiangkou Reservoir. Li Guoying, Vice Commander-in-Chief of the SFDH and Minister of Water Resources, presided over 10 dedicated consultations and proposed that the Danjiangkou Reservoir's water source area, water recipient areas, and related regions be treated as a single integrated entity. He emphasized the need to adhere to systematic thinking, act in accordance with laws and regulations, implement unified scheduling, coordinate across the basin and regions, combine short-term and long-term measures, and pursue both water conservation and increasing water sources and to implement unified, joint dispatch of water infrastructure per one unit of flow, storage capacity, and water level. The goal was to effectively safeguard water supply security for the Middle Route of the South-to-North Water Diversion Project, the middle and lower reaches of the Hanjiang River, and the city of Xi'an.

First, the “four preemptive” measures were reinforced to support the scientific and precise dispatch of water projects. Via an integrated “space-air-ground-water-project” monitoring and sensing system, real-time, comprehensive monitoring of rainfall, river runoff, water quality, reservoir water levels, and water consumption in upstream and downstream areas of the basin was conducted. Proactive and continuous assessment of risks associated with the low-water operation of the Danjiangkou Reservoir was made, the digital twin Danjiangkou platform was used to simulate inflow processes on a daily basis, and precise analyses of water supply and demand balances were conducted, thereby providing robust support for water engineering dispatch.

Second, by coordinating replenishment from upstream and controlling release downstream, Danjiangkou Reservoir was stopped from further declining and managed to recover its water storage. The supply potential of the upstream Hanjiang reservoir group was fully tapped into: 19 upstream reservoirs—including Ankang, Gushan, Pankou, and Huanglongtan—were dispatched to cumulatively replenish Danjiangkou Reservoir with 1.79 billion m³ of water. The Danjiangkou Reservoir was operated to dynamically adjust flows to the Middle Route of the South-to-North Water Diversion Project, the middle and lower Hanjiang, the Danjiangkou-to-Xiangyang Irrigation District, and E'Bei (northern Hubei) water resources allocation project. In the meantime, relevant regions strengthened water conservation and maximized the use efficiency of available water. Through replenishment upstream and control downstream, the further decline in Danjiangkou Reservoir was promptly halted. By May 30, 2025, the water level had rebounded to 150.00 m. Despite the absence of major rainfall events in the upper Hanjiang basin during June, the water level in Danjiangkou Reservoir remained between 150.00-150.20 m for nearly 30 days.

Third, coordinated management across river basins and regions ensured water supply security for all parties. Cross-basin, cross-regional, and long-distance water dispatch was implemented, with water sources



supplemented through multiple channels. The outflow from the Three Gorges Reservoir was maintained at over 14,000 m³/s during July and August to support the Yangtze-to-Hanjiang River Diversion Project in diverting water at a high flow rate of no less than 400 m³/s, thereby replacing the reduced discharge from the Danjiangkou Reservoir with water from the Yangtze mainstream. A total of 95 million m³ of water from reservoirs on middle Hanjiang's tributaries were diverted, such as Yahekou and Sanliping, to provide for urban and rural water needs in the middle and lower reaches of the Hanjiang. Water allocations to the middle and lower reaches of the Hanjiang, the Danjiangkou-to Xiangyang Irrigation District, and the E'Bei Water Resources Allocation Project were increased at times of need to guarantee seasonal irrigation for autumn grains. The flow to the Middle Route of the South-to-North Water Diversion Project was dynamically adjusted and regions along the route strengthened water source scheduling to ensure water supply security. The Hanjiang-to-Weihe Water Diversion Project was carefully and precisely scheduled to sustain cross-basin water transfers to Xi'an, supporting the city to overcome water shortages.

案例 8 淮河流域夏伏旱应对

2025 年，淮河流域主汛期降雨罕见偏少，7 月持续晴热高温，无有效降雨达 23 天，南四湖下级湖水位最低时仅高于最低生态水位 0.11 米，流域内河南、安徽、江苏、山东四省均不同程度发生旱情，保障抗旱供水和生态安全形势严峻。淮委启动抗旱应急响应持续 25 天，会同相关省统筹谋划，强化雨水情监测，优化抗旱水源调度，最大程度减轻了干旱影响和损失。

一是加强监测预警，争取抗旱主动。淮委早期派出 8 个工作组、2 个水文应急监测组，调研监测东平湖应急分水、南四湖出湖河道、引江济淮工程调度等情况，利用无人船、多普勒流量计持续开展应急监测 121 站次，收集数据 506 组，发布雨水情预报材料 68 期，及时对南四湖下级湖、淮河干流蚌埠闸及洪泽湖发布干旱预警，向河南、安徽、江苏、山东四省先后 2 次发出通知，指导抗旱保供水工作。

二是巧用洪水过程，为抗旱补水调水。7 月上旬，调度南四湖上级湖有效拦蓄梅雨期降雨尾水，为下级湖补水 1900 万立方米。8 月上旬，淮河流域出现两次强降雨过程，在确保防洪安全的前提下，利用大型水库、洪泽湖等合理拦蓄雨洪资源 8.22 亿立方米。指导江苏省抓住淮河、里下河地区降雨稍丰时机，利用南水北调东线一期工程全力向骆马湖、南四湖错峰引调水 1.51 亿立方米。

三是细化用水调度，全力保障安全。指导江苏省利用南水北调东线一期工程满负荷抽水 16.85 亿立方米，北调入南四湖 3000 万立方米，南四湖上、下级湖累计供水 2.1 亿立方米，有效保障约 3000 万人供水安全、2000 多千公顷水稻灌溉需求以及京杭大运河通航安全。指导安徽省、河南省用足引江济淮工程能力，引江水入淮 4.41 亿立方米，有效支援沿线 10 个地市约 3000 万城乡居民生活用水、1000 千公顷农作物时令灌溉用水。针对洪汝河班台、沙颍河周口、淮干蚌埠闸等生态流量不达标及南四湖下级湖生态水位预警情况，督促河南、安徽、山东、江苏省采取有效调度和管控措施，加强水资源调度和取用水管控，确保河道合理水位和生态流量。

四是实施跨流域调水，让远水解近渴。统筹“远地、近地、当地”水源，充分利用引调水工程，高效实施跨流域应急调水。协商黄委调度黄河流域东平湖向南四湖跨流域抗旱补水 8000 万立方米，有效利用洪水资源缓解南四湖低水位形势。调度南四湖开启二级坝枢纽利用上级湖水源向下级湖应急补水 4000 万立方米，抬升水位 0.27 米，避免跌破生态预警水位。相继启动引江济淮工程菜子湖线、西兆河应急线路，按最大流量向淮河引送江水，持续引江时长 21 天，引水总量 2.62 亿立方米，抬高蚌埠闸上水位近 1 米，有力保障沿淮灌溉、航运和生态流量下泄。

五是严格用水管控，提高用水效率。督促指导四省严格抗旱用水监管，视情采取措施限制一般工业用水，适度压减非关键期农作物用水，加大农业灌溉节水力度，提高抗旱用水效率。江苏省及时压减洪泽湖二河闸等口门出湖流量，减缓洪泽湖水位下降趋势。全面加强南四湖下级湖取水计量线上监管，开展现场巡查监督，及时关闭沿湖无控取水闸门，压减出湖流量至最小 10 立方米每秒，减缓南四湖下级湖水位下降过快趋势。

Case 8

Response to the mid-summer drought in the Huaihe River Basin

In 2025, rainfall during the main flood season in the Huaihe River Basin was unusually low. In July, it was persistent hot and sunny weather with no effective rainfall for 23 days. At its worst, the lower Nansi Lakes were only 0.11 m above the minimum ecological water level. Droughts struck to varying degrees the four provinces—Henan, Anhui, Jiangsu, and Shandong—within the basin, creating severe pressures on drought relief and ensuring ecological safety. The Huaihe Commission activated a 25-day drought relief emergency response, coordinated with relevant provinces to develop a unified plan, strengthened rainfall and hydrological monitoring, and optimized the allocation of water resources for drought relief, thereby minimizing the impact and losses to droughts to the greatest extent possible.

First, monitoring and early warning were strengthened to gain more favourable conditions in drought relief. During the drought period, the Huaihe Commission dispatched eight working groups and two hydrological emergency monitoring teams to study and monitor the emergency water diversion at Dongping Lake, the outflow channels of the Nansi Lakes, and the scheduling of the Yangtze-to Huaihe Water Diversion Project. Utilizing unmanned vessels and Doppler flow meters, they conducted 121 emergency monitoring at stations, collected 506 sets of data, and issued 68 rainfall and hydrological reports, promptly issuing drought warnings for the lower Nansi Lakes, the Bengbu Sluice on the Huaihe mainstream, and Hongze Lake; and issued notifications twice to Henan, Anhui, Jiangsu, and Shandong provinces to guide drought relief and water supply efforts.

Second, flood events were smartly utilized to provide water for drought relief. In early July, the upper Nansi Lakes effectively retained the last waters from the plum rain season, replenishing the lower lakes with 19 million m³ of water. In early August, the Huaihe River basin experienced two episodes of heavy rainfall. While ensuring flood safety, 822 million m³ of rain and floodwater was retained in large reservoirs and Hongze Lake. When there was relatively ample rainfall in the Huaihe and Lixia rivers, guidance was provided to Jiangsu Province to seize the timing, despite it was the off-peak period, to divert 151 million m³ of water to Luoma Lake and Nansi Lakes via the first phase of the Eastern Route of the South-to-North Water Diversion Project.

Third, refined water allocation was conducted to ensure water security. Jiangsu Province used the Eastern Route Phase I of the South-to-North Water Diversion Project at full capacity to draw 1.685 billion m^3 of water from the Yangtze River and diverted 30 million m^3 northward into the Nansi Lakes, enabling water supplies totaling 210 million m^3 from the upper and lower lakes of the Nansi Lakes. This ensured the water supply security for approximately 30 million people, met the irrigation needs of over 2 million ha of rice paddies, and safeguarded navigation safety on the Beijing-Hangzhou Grand Canal. Anhui and Henan fully utilized the capacity of the Yangtze-to-Huaihe Water Diversion Project and diverted 441 million m^3 in total. This effectively supported the domestic water needs of approximately 30 million urban and rural residents across 10 cities along the diversion route, as well as the seasonal irrigation needs of 1 million ha of crops. In response to substandard ecological flows at Bantai Sluice on the Honghe-Ruhe River, Zhoukou Sluice on the Shaying River, and Bengbu Sluice on the Huaihe mainstream, as well as warnings regarding ecological water levels in the lower lakes of the Nansi Lakes, Henan, Anhui, Shandong, and Jiangsu implemented effective water resources scheduling and control measures, and strengthened scheduling and the regulation of water abstraction and use to ensure reasonable in-stream levels and ecological flows.

Fourth, inter-basin water transfer was implemented to address immediate water shortages with “borrowed” water. By coordinating water sources from distant, nearby, and local areas and making full use of water diversion and transfer projects, emergency inter-basin water transfers were realized. The Yellow River Commission, after consultation, managed to divert 80 million m^3 of water from Dongping Lake in the Yellow River basin to the Nansi Lakes, utilizing floodwater resources to restore the depleted Nansi Lakes. The secondary dam on the Nansi Lakes was activated and operated to divert 40 million m^3 from the upper lakes to replenish the lower lakes, raising the water level by 0.27 m and preventing it from falling below the ecological warning level. As to the Yangtze-to-Huaihe water diversion project, its Caizihu route and Xizhao River emergency route were activated to divert from the Yangtze River water to the Huaihe at maximum flow rates. The diversion lasted 21 days and diverted 262 million m^3 in total, raising the water level upstream of the Bengbu Sluice by nearly 1 m, thereby effectively ensuring irrigation, navigation, and the release of ecological flows on the Huaihe River.

Fifth, strict water use controls were implemented and water use efficiency was improved. The four provinces were guided to strictly regulate water use for drought relief, taking measures as appropriate to restrict general-purpose industrial water use, restrict water use for crops in non-critical periods, enhance water saving in agricultural irrigation, and improve the efficiency of water use for drought relief. Jiangsu Province promptly reduced outflows from Erhe Sluice and other outlets on Hongze Lake to slow the decline in the lake. Online monitoring of water abstraction and consumption in the lower Nansi Lakes was enhanced, with site patrols and supervision, prompt closure of uncontrolled abstraction via sluices, so as to reduce outflow to a minimum of 10 m^3/s and slow down the fast decline in the lower Nansi Lakes.

附录2

APPENDIX

2

1950—2025 年 全国水旱灾情统计

STATISTICS ON FLOOD AND
DROUGHT DISASTERS IN CHINA,
1950—2025

附表 1 1950—2025 年全国洪涝灾情统计
Appendix table 1 Flood disasters and losses, 1950–2025

年份 Year	农作物受灾面积 / 千公顷 Affected cropland area/1,000 ha	农作物成灾面积 / 千公顷 Damaged cropland area/1,000 ha	因灾死亡失踪人口 / 人 Deaths and missing persons/ person	倒塌房屋 / 万间 Collapsed dwellings/ 10,000 rooms	直接经济损失 / 亿元 Direct economic losses/ 100 million RMB
1950	6559.00	4710.00	1982	130.50	—
1951	4173.00	1476.00	7819	31.80	—
1952	2794.00	1547.00	4162	14.50	—
1953	7187.00	3285.00	3308	322.00	—
1954	16131.00	11305.00	42447	900.90	—
1955	5247.00	3067.00	2718	49.20	—
1956	14377.00	10905.00	10676	465.90	—
1957	8083.00	6032.00	4415	371.20	—
1958	4279.00	1441.00	3642	77.10	—
1959	4813.00	1817.00	4540	42.10	—
1960	10155.00	4975.00	6033	74.70	—
1961	8910.00	5356.00	5074	146.30	—
1962	9810.00	6318.00	4350	247.70	—
1963	14071.00	10479.00	10441	1435.30	—
1964	14933.00	10038.00	4288	246.50	—
1965	5587.00	2813.00	1906	95.60	—
1966	2508.00	950.00	1901	26.80	—
1967	2599.00	1407.00	1095	10.80	—
1968	2670.00	1659.00	1159	63.00	—
1969	5443.00	3265.00	4667	164.60	—
1970	3129.00	1234.00	2444	25.20	—
1971	3989.00	1481.00	2323	30.20	—
1972	4083.00	1259.00	1910	22.80	—
1973	6235.00	2577.00	3413	72.30	—
1974	6431.00	2737.00	1849	120.00	—

续表 Continued

年份 Year	农作物受灾面积 / 千公顷 Affected cropland area/1,000 ha	农作物成灾面积 / 千公顷 Damaged cropland area/1,000 ha	因灾死亡失踪人口 / 人 Deaths and missing persons/ person	倒塌房屋 / 万间 Collapsed dwellings/ 10,000 rooms	直接经济损失 / 亿元 Direct economic losses/ 100 million RMB
1975	6817.00	3467.00	29653	754.30	—
1976	4197.00	1329.00	1817	81.90	—
1977	9095.00	4989.00	3163	50.60	—
1978	2820.00	924.00	1796	28.00	—
1979	6775.00	2870.00	3446	48.80	—
1980	9146.00	5025.00	3705	138.30	—
1981	8625.00	3973.00	5832	155.10	—
1982	8361.00	4463.00	5323	341.50	—
1983	12162.00	5747.00	7238	218.90	—
1984	10632.00	5361.00	3941	112.10	—
1985	14197.00	8949.00	3578	142.00	—
1986	9155.00	5601.00	2761	150.90	—
1987	8686.00	4104.00	3749	92.10	—
1988	11949.00	6128.00	4094	91.00	—
1989	11328.00	5917.00	3270	100.10	—
1990	11804.00	5605.00	3589	96.60	239.00
1991	24596.00	14614.00	5113	497.90	779.08
1992	9423.30	4464.00	3012	98.95	412.77
1993	16387.30	8610.40	3499	148.91	641.74
1994	18858.90	11489.50	5340	349.37	1796.60
1995	14366.70	8000.80	3852	245.58	1653.30
1996	20388.10	11823.30	5840	547.70	2208.36
1997	13134.80	6514.60	2799	101.06	930.11
1998	22291.80	13785.00	4150	685.03	2550.90
1999	9605.20	5389.12	1896	160.50	930.23
2000	9045.01	5396.03	1942	112.61	711.63

续表 Continued

年份 Year	农作物受灾面积 / 千公顷 Affected cropland area/1,000 ha	农作物成灾面积 / 千公顷 Damaged cropland area/1,000 ha	因灾死亡失踪人口 / 人 Deaths and missing persons/ person	倒塌房屋 / 万间 Collapsed dwellings/ 10,000 rooms	直接经济损失 / 亿元 Direct economic losses/ 100 million RMB
2001	7137.78	4253.39	1605	63.49	623.03
2002	12384.21	7439.01	1819	146.23	838.00
2003	20365.70	12999.80	1551	245.42	1300.51
2004	7781.90	4017.10	1282	93.31	713.51
2005	14967.48	8216.68	1660	153.29	1662.20
2006	10521.86	5592.42	2276	105.82	1332.62
2007	12548.92	5969.02	1230	102.97	1123.30
2008	8867.82	4537.58	865	44.70	955.44
2009	8748.16	3795.79	648	55.59	845.96
2010	17866.69	8727.89	4225	227.10	3745.43
2011	7191.50	3393.02	640	69.30	1301.27
2012	11218.09	5871.41	832	58.60	2675.32
2013	11777.53	6540.81	1149	53.36	3155.74
2014	5919.43	2829.99	577	25.99	1573.55
2015	6132.08	3053.84	400	15.23	1660.75
2016	9443.26	5063.49	893	42.77	3643.26
2017	5196.47	2781.19	355	13.78	2142.53
2018	6426.98	3131.16	219	8.51	1615.47
2019	6680.40	3928.97	658	10.30	1922.70
2020	7190.00	4118.21	279	9.00	2669.80
2021	4760.43	2643.05	590	15.20	2458.92
2022	3413.73	1834.57	171	3.13	1288.99
2023	4633.29	2320.90	309	13.00	2445.75
2024	6035.81	3224.57	436	5.70	2598.10
2025	2594.08	1311.05	400	2.70	1646.61

注 2019—2025 年数据来源于应急管理部；“—”表示没有统计数据。

Note Data for 2019–2025 are sourced from the Ministry of Emergency Management; “–” indicates no statistics available.

附表 2 1950—2025 年全国干旱灾情统计
Appendix table 2 Drought disasters and losses, 1950–2025

年份 Year	农作物因旱受灾 面积 / 千公顷 Affected cropland area/1,000 ha	农作物因旱成灾 面积 / 千公顷 Damaged cropland area/1,000 ha	农作物因旱绝收 面积 / 千公顷 Failed cropland area/1,000 ha	因旱粮食损失 / 亿千克 Grain yield losses/ 100 million kg	因旱饮水困难 人口 / 万人 People with drinking water difficulties/ 10,000 persons	因旱饮水困难 大牲畜 / 万头 Bigger-sized livestock with drinking water difficulties/10,000 heads	直接经济 损失 / 亿元 Direct economic losses/100 million RMB
1950	2398.00	589.00	—	19.00	—	—	—
1951	7829.00	2299.00	—	36.88	—	—	—
1952	4236.00	2565.00	—	20.21	—	—	—
1953	8616.00	1341.00	—	54.47	—	—	—
1954	2988.00	560.00	—	23.44	—	—	—
1955	13433.00	4024.00	—	30.75	—	—	—
1956	3127.00	2051.00	—	28.60	—	—	—
1957	17205.00	7400.00	—	62.22	—	—	—
1958	22361.00	5031.00	—	51.28	—	—	—
1959	33807.00	11173.00	—	108.05	—	—	—
1960	38125.00	16177.00	—	112.79	—	—	—
1961	37847.00	18654.00	—	132.29	—	—	—
1962	20808.00	8691.00	—	89.43	—	—	—
1963	16865.00	9021.00	—	96.67	—	—	—
1964	4219.00	1423.00	—	43.78	—	—	—
1965	13631.00	8107.00	—	64.65	—	—	—
1966	20015.00	8106.00	—	112.15	—	—	—
1967	6764.00	3065.00	—	31.83	—	—	—
1968	13294.00	7929.00	—	93.92	—	—	—
1969	7624.00	3442.00	—	47.25	—	—	—
1970	5723.00	1931.00	—	41.50	—	—	—
1971	25049.00	5319.00	—	58.12	—	—	—
1972	30699.00	13605.00	—	136.73	—	—	—
1973	27202.00	3928.00	—	60.84	—	—	—
1974	25553.00	2296.00	—	43.23	—	—	—
1975	24832.00	5318.00	—	42.33	—	—	—

续表 Continued

年份 Year	农作物因旱受灾 面积 / 千公顷 Affected cropland area/1,000 ha	农作物因旱成灾 面积 / 千公顷 Damaged cropland area/1,000 ha	农作物因旱绝收 面积 / 千公顷 Failed cropland area/1,000 ha	因旱粮食损失 / 亿千克 Grain yield losses/ 100 million kg	因旱饮水困难 人口 / 万人 People with drinking water difficulties/ 10,000 persons	因旱饮水困难 大牲畜 / 万头 Bigger-sized livestock with drinking water difficulties/10,000 heads	直接经济 损失 / 亿元 Direct economic losses/100 million RMB
1976	27492.00	7849.00	—	85.75	—	—	—
1977	29852.00	7005.00	—	117.34	—	—	—
1978	40169.00	17969.00	—	200.46	—	—	—
1979	24646.00	9316.00	—	138.59	—	—	—
1980	26111.00	12485.00	—	145.39	—	—	—
1981	25693.00	12134.00	—	185.45	—	—	—
1982	20697.00	9972.00	—	198.45	—	—	—
1983	16089.00	7586.00	—	102.71	—	—	—
1984	15819.00	7015.00	—	106.61	—	—	—
1985	22989.00	10063.00	—	124.04	—	—	—
1986	31042.00	14765.00	—	254.34	—	—	—
1987	24920.00	13033.00	—	209.55	—	—	—
1988	32904.00	15303.00	—	311.69	—	—	—
1989	29358.00	15262.00	2423.33	283.62	—	—	—
1990	18174.67	7805.33	1503.33	128.17	—	—	—
1991	24914.00	10558.67	2108.67	118.00	4359.00	6252.00	—
1992	32980.00	17048.67	2549.33	209.72	7294.00	3515.00	—
1993	21098.00	8658.67	1672.67	111.80	3501.00	1981.00	—
1994	30282.00	17048.67	2526.00	233.60	5026.00	6012.00	—
1995	23455.33	10374.00	2121.33	230.00	1800.00	1360.00	—
1996	20150.67	6247.33	686.67	98.00	1227.00	1675.00	—
1997	33514.00	20010.00	3958.00	476.00	1680.00	850.00	—
1998	14237.33	5068.00	949.33	127.00	1050.00	850.00	—
1999	30153.33	16614.00	3925.33	333.00	1920.00	1450.00	—
2000	40540.67	26783.33	8006.00	599.60	2770.00	1700.00	—
2001	38480.00	23702.00	6420.00	548.00	3300.00	2200.00	—

续表 Continued

年份 Year	农作物因旱受灾 面积 / 千公顷 Affected cropland area/1,000 ha	农作物因旱成灾 面积 / 千公顷 Damaged cropland area/1,000 ha	农作物因旱绝收 面积 / 千公顷 Failed cropland area/1,000 ha	因旱粮食损失 / 亿千克 Grain yield losses/ 100 million kg	因旱饮水困难 人口 / 万人 People with drinking water difficulties/ 10,000 persons	因旱饮水困难 大牲畜 / 万头 Bigger-sized livestock with drinking water difficulties/10,000 heads	直接经济 损失 / 亿元 Direct economic losses/100 million RMB
2002	22207.33	13247.33	2568.00	313.00	1918.00	1324.00	—
2003	24852.00	14470.00	2980.00	308.00	2441.00	1384.00	—
2004	17255.33	7950.67	1677.33	231.00	2340.00	1320.00	—
2005	16028.00	8479.33	1888.67	193.00	2313.00	1976.00	—
2006	20738.00	13411.33	2295.33	416.50	3578.23	2936.25	986.00
2007	29386.00	16170.00	3190.67	373.60	2756.00	2060.00	1093.70
2008	12136.80	6797.52	811.80	160.55	1145.70	699.00	545.70
2009	29258.80	13197.10	3268.80	348.49	1750.60	1099.40	1206.59
2010	13258.61	8986.47	2672.26	168.48	3334.52	2440.83	1509.18
2011	16304.20	6598.60	1505.40	232.07	2895.45	1616.92	1028.00
2012	9333.33	3508.53	373.80	116.12	1637.08	847.63	533.00
2013	11219.93	6971.17	1504.73	206.36	2240.54	1179.35	1274.51
2014	12271.70	5677.10	1484.70	200.65	1783.42	883.29	909.76
2015	10067.05	5577.04	1005.39	144.44	836.43	806.77	579.22
2016	9872.76	6130.85	1018.20	190.64	469.25	649.73	484.15
2017	9946.43	4490.02	752.71	134.44	477.78	514.29	437.88
2018	7397.21	3667.23	610.21	156.97	306.69	462.30	483.62
2019	7838.00	4760.17	1113.60	92.29	692.29	368.10	457.40
2020	5081.00	2759.08	704.50	123.04	668.98	448.63	249.20
2021	3426.16	1949.00	464.12	49.28	546.35	250.63	200.87
2022	6090.21	2858.39	611.78	57.44	542.38	331.92	512.85
2023	3803.70	1488.90	218.37	33.88	274.74	278.29	205.51
2024	1206.24	565.56	135.42	17.36	174.55	136.22	83.59
2025	1862.22	716.62	100.01	17.90	59.38	51.15	86.48

注 2019—2025 年数据第 2、3、4、8 列来源于应急管理部；第 2 列“农作物因旱受灾面积”2019 年之前为“作物因旱受灾面积”；第 3 列“农作物因旱成灾面积”2019 年之前为“作物因旱成灾面积”；第 4 列“农作物因旱绝收面积”2019 年之前为“作物因旱绝收面积”；“—”表示没有统计数据。

Note Data during 2019–2025 in columns 2, 3, 4, and 8 are sourced from the Ministry of Emergency Management; “—” indicates no statistics available.

