



中国城市防洪建设

Urban Flood Control Construction in China

中国水利水电科学研究院

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一、城市防洪建设基本情况

1. Basic information of urban flood control construction

一、城市防洪建设基本情况

1. Basic information of urban flood control construction

✦ 城市是一个国家或地区的政治、经济、金融、产业与文化的中心，在区域社会经济可持续发展中起着核心作用。

Cities are the political, economic, financial, industrial and cultural center of a country or region, and plays a core role in the sustainable development of regional social economy.

✦ 我国**692座**建制市辖区人口约**8.4亿**，面积约**236.9万 km²**（2021年），以近**四分之一**的国土面积，居住了全国**一半以上人口**，拥有全国**近四分之三**的经济总量，在我国社会和经济发展战略中地位极为重要。

There are **692** cities in China, where about 840 million people live, with area about **2.369 million km²** (2021). With nearly a quarter of the national land area, live more than half of the country's population and have nearly three quarters of the country's total economic volume, which is extremely important in China's social and economic development strategy.

✦ 其中，有**629座城市**具有防洪任务，河流穿城而过或傍城而过。**31个重点防洪城市**，**54座重要防洪城市**，其余为一般防洪城市。

Among 692 cities in China, **629 cities** have flood control tasks. Rivers pass through or near the cities. **31 key flood control cities**, **54 important flood control cities**, and the rest are general flood control cities.

《防洪法》：受洪水威胁的城市、经济开发区、工矿区和国家重要的农业生产基地等，应当重点保护，建设必要的防洪工程设施。

Flood Control Law: Cities, economic development zones, industrial and mining areas, as well as important national agricultural production bases that are threatened by floods should be given priority to protection and necessary flood control projects should be constructed.

一、城市防洪建设基本情况

1. Basic information of urban flood control construction

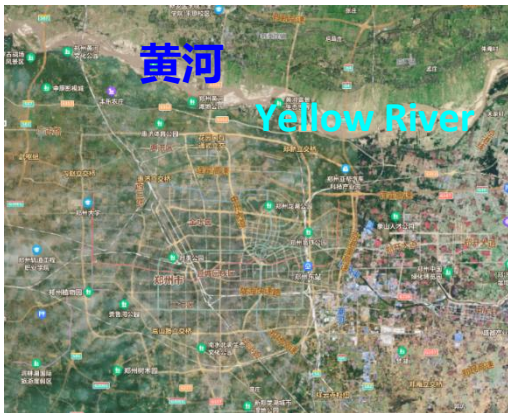
✦ 外洪防御是我国城市防洪的首要任务。

Flood prevention from external rivers is the primary task of urban flood control in China.

✦ 我国各防洪城市结合自身需求，积极推进江河堤防、海塘及城市防洪圈的建设，治理城市河道，综合建设水库、蓄洪区、涵闸等工程，逐步形成和完善了防御城市外洪的工程体系。 All flood control cities in China, in combination with their own needs, actively promote the construction of river embankments, seawalls and urban flood control circles, regulate urban river courses, comprehensively construct reservoirs, flood storage areas, culverts and other projects, and gradually form and improve the engineering system for urban flood prevention.

✦ 全国已建有城市防洪堤防超过3.4万km (2016年统计数据)

More than 34000 km of urban flood control dikes have been built in China (statistical data in 2016)



上海 Shanghai

◆ 千里海塘防线

Thousand-mile seawall defense line

◆ 千里江堤防线

Thousand-mile river embankments defense



一、城市防洪建设基本情况

1. Basic information of urban flood control construction

✦ 通过与上游水库、堤防、蓄滞洪区的联合运用，进一步提高了城市防洪标准

Through joint operation with upstream reservoirs, embankments and flood storage and detention areas, urban flood control standards have been further improved

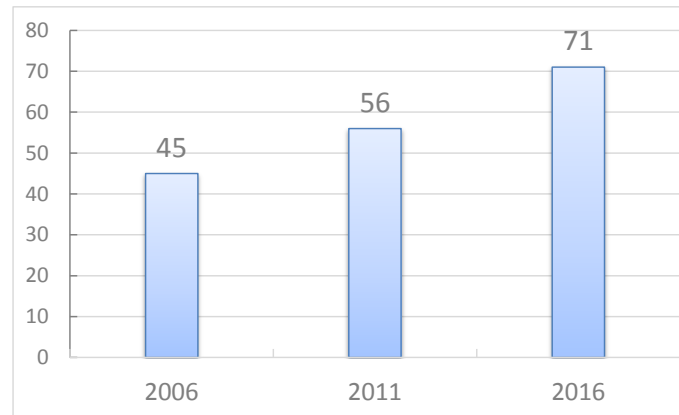


通过三峡及上游控制性水库调节，荆江河段遇**100年一遇**及以下洪水，**不需启用荆江地区蓄滞洪区**；遇**1000年一遇**洪水，配合荆江地区蓄滞洪区的运用，可保证荆江河段行洪安全。

Through the regulation of the Three Gorges and the upstream control reservoirs, the Jingjiang River section does not need to use the flood storage and detention area in the Jingjiang River area when it encounters floods with a return period of 100 years or below. In case of 1000-year flood, the flood discharge safety of Jingjiang reach can be guaranteed with the application of flood storage and detention areas in Jingjiang area.

✦ 31座重点防洪城市的建设情况

Construction of 31 Key Flood Control Cities



主城区防洪标准达到或超过100年一遇的城市数量
Number of cities with a 100 - year flood control standard or higher

A decorative blue square with a diagonal split, the top-left half being a lighter shade of blue and the bottom-right half being a darker shade.

二、相关的法律法规、规范标准

2. Relevant laws, regulations and standards

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国家颁布的城市防洪相关法律法规

Laws and Regulations on Urban Flood Control promulgated by the State

⊕ 《水法》（1988制定，2016年修正）

Water Law

⊕ 《防洪法》（1998年颁布，2016年修正）

Flood Control Law

⊕ 《土地管理法》（1986年制定，1999修订，2019年修正）

Land Management Law

⊕ 《城乡规划法》（1989年颁布，2019年修正）

Urban-rural Planning Law

⊕ 《河道管理条例》（1988年发布，2018年修正）

River Management Regulations

⊕ 《防汛条例》（1991年制定，2005年修订）等。

Flood Control Regulations

城市制定的地方性法律法规

Local laws and regulations formulated by cities

我国大多数城市在遵照执行上述的国家法律法规外，还结合城市自身实际情况，制定了诸如：

Most cities in China have also formulated the following policies in combination with their own actual conditions:

⊕ 《城市防洪管理规定》

Urban Flood Control Management Regulations

⊕ 《城市防洪条例》 Urban Flood Control Regulations

⊕ 《城市防汛条例》或《城市防汛抗旱条例》等。

Urban Flood Control and Drought Relief Regulations

如：《武汉市城市防洪管理规定》 Wuhan city flood control management regulations

《南昌市城市防洪条例》 Nanchang city flood control regulations

《上海市防汛条例》 Shanghai flood control regulations

《重庆市防汛抗旱条例》 Chongqing flood control and drought relief regulations

二、相关的法律法规、规范标准

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规范标准

- ⊕ 《防洪标准》 (GB50201-2014)
Standard for flood control
- ⊕ 《城市防洪规划规范》 (GB 51079-2016)
Code for urban planning on flood control
- ⊕ 《城市防洪工程设计规范》 (GB/T 50805-2012)
Code for design of urban flood control project
- ⊕ 《城市水系规划导则》 (SL 431-2008)
Guidelines for urban river and lake system planning
- ⊕ 《城市防洪应急预案编制导则》 (SL 754-2017)
Guidelines for the formulation of urban flood emergency plan
- ⊕ 《防洪规划编制规程》 (SL 669-2014)
Code for formulation of flood mitigation planning
- ⊕ 《治涝标准》 (SL723-2016)
Standard for waterlogging control
- ⊕ 《城镇内涝防治技术规范》 (GB51222-2017)
Technical code for urban flooding prevention and control



二、相关的法律法规、规范标准

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《防洪标准》（GB50201-2014）Standard for flood control

按照城市人口、经济当量，规定了不同规模城市应达到的防洪标准。
According to the urban population and economic equivalent, the flood control standards for cities of different sizes are stipulated.

防护等级 Protection level	重要性 Importance	常住人口（万人） Permanent population (ten thousands)	当量经济规模（万人） Equivalent economic scale (ten thousands)	防洪标准 Flood control standard [重现期（年）] Return period (year)
I	特别重要 particularly important	≥150	≥300	≥200
II	重要 important	<150 , ≥50	<300 , ≥100	200 ~ 100
III	比较重要 relatively important	<50 , ≥20	<100 , ≥40	100 ~ 50
IV	一般 general	<20	<40	50 ~ 20

当量经济规模：城市防护区人均GDP指数与人口的乘积,人均GDP指数为城市防护区人均 GDP与同期全国人均 GDP的比值。

The equivalent economic scale : the product of the per capita GDP index of the urban protection zone and the population. The per capita GDP index is the ratio of the per capita GDP of the urban protection zone to the per capita GDP of the whole country in the same period.

A decorative blue square with a diagonal split, the top-left half being a lighter shade of blue and the bottom-right half being a darker shade.

三、城市防洪应急预案编制

3. Formulation of urban flood emergency plan

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1999年国家防办印发了《城市防洪预案编制大纲》（办库[1999]8号文）

In 1999, the National Defence Office issued the Outline for the Preparation of Urban Flood Control Plans



2006年重新修订并印发了《城市防洪应急预案编制大纲》

In 2006, Outline of Urban Flood Control Emergency Plan was revised and issued in



2015年，国家防办下发《城市防洪应急预案管理办法》

In 2015, the National Defense Office issued Administrative Measures for Emergency Plans for Urban Flood Control



2017年，水利部颁布《城市防洪应急预案编制导则（SL 754-2017）》

In 2017, the Ministry of Water Resources issued Guidelines for the preparation of emergency plans for urban flood control



2020~2022年，根据水利部要求，编制、修订完善城市超标洪水防御预案

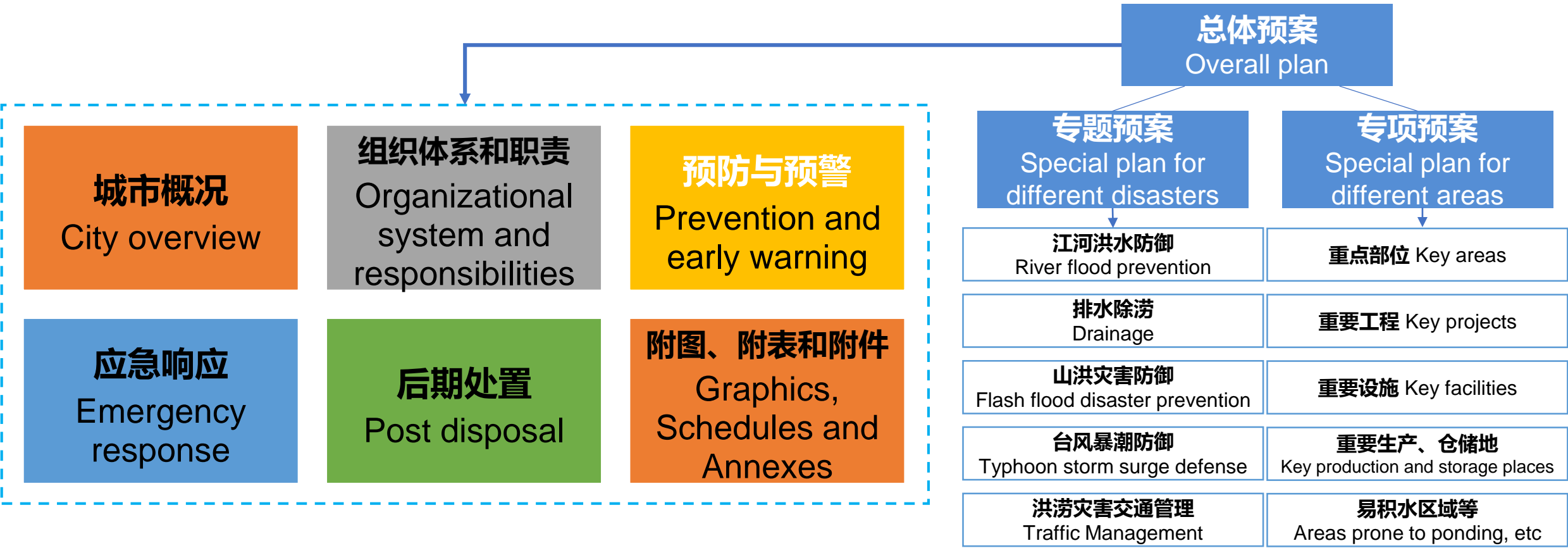
From 2020 to 2022, Compile, revise and improve urban over-standard flood prevention plan

三、城市防洪应急预案编制

3. Formulation of urban flood emergency plan

据不完全统计，我国城市防洪应急预案编制率已达99.5%，且绝大部分城市按1～5年的周期对预案进行修编和更新。

According to incomplete statistics, the formulation rate of urban flood control emergency plans in China has reached 99.5 %, and most cities have revised and updated the plans every 1 to 5 years.



三、城市防洪应急预案编制

3. Formulation of urban flood emergency plan

如北京市除编制**市级防汛应急预案**外，还编制了**重点河道、大中型水库**的洪水调度方案、**防御洪水方案**和**防汛抢险预案**，针对**首都机场、城市道路、立交桥**等实现了“**一桥一预案**”，针对易受洪水威胁的**地下空间**等编制预案。

For example, in addition to the preparation of **municipal flood control emergency plans**, Beijing has also prepared flood dispatching plans, flood prevention plans and flood control emergency plans for **key rivers** and large and medium-sized **reservoirs**. For the **capital airport, urban roads, overpasses**, etc., **One Bridge One Plan** has been realized, and plans have been prepared for **underground spaces** that are vulnerable to flood threats.



北京市应急管理局
BEIJING EMERGENCY MANAGEMENT BUREAU

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当前位置: 首页>政务公开>应急预案

北京市突发事件应急委员会关于印发《北京市防汛应急预案(2022年修订)》的通知

发布日期: 2022-07-28 09:58 【字体: 大 中 小】

北京市突发事件应急委员会关于印发《北京市防汛应急预案(2022年修订)》的通知

各区人民政府, 市政府各委、办、局, 各相关单位:
《北京市防汛应急预案(2022年修订)》已经市政府同意, 现印发给你们, 请认真贯彻执行。

北京市突发事件应急委员会
2022年7月19日

北京市防汛应急预案(2022年修订)

目录

1. 总则
1.1 指导思想
1.2 基本原则
1.3 工作目标
1.4 编制依据



中心城区257座下凹桥、150处防汛风险点
257 concave bridges and 150 flood control risk points



四、城市洪水风险图编制

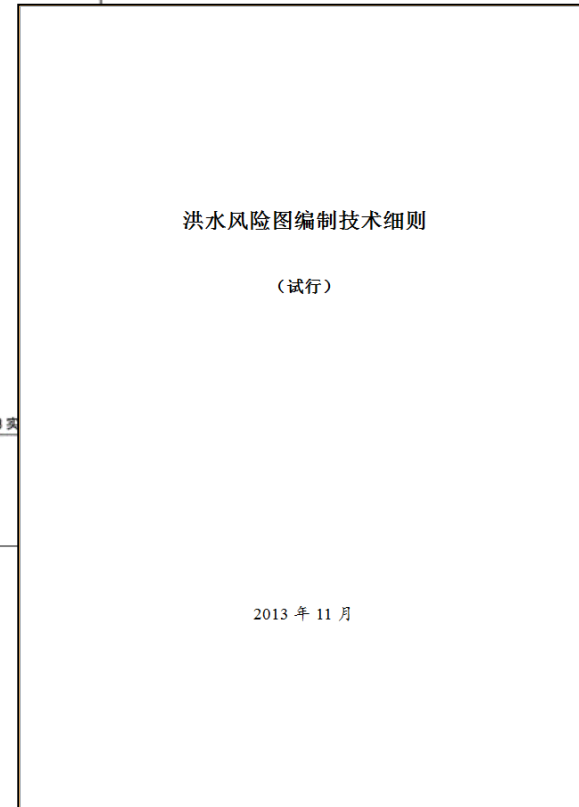
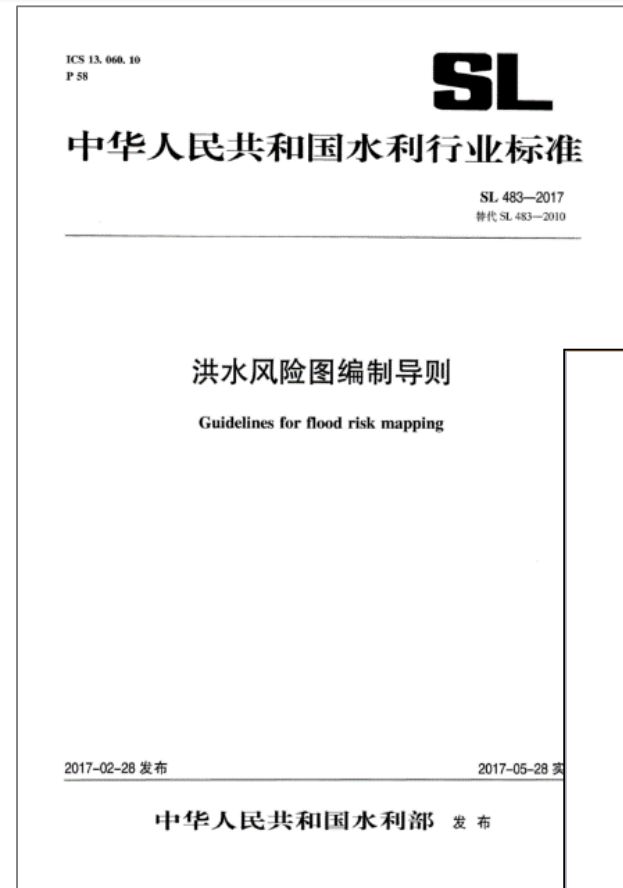
4. Urban flood risk mapping

四、城市洪水风险图编制 4. Urban flood risk mapping

技术规范 10余项 More than 10 technical specifications

- 《洪水风险图编制**导则**》 [Guidelines](#) for flood risk mapping
- 《洪水风险图编制**技术细则**》 [Technical Rules](#) for Flood Risk Mapping
- 《避洪转移图编制技术要求》 Technical requirements for flood evacuation mapping
- 《洪水风险图地图数据分类、编码与数据表结构》 Flood risk map data classification, coding and data table structure
- 《洪水风险图**制图技术要求**》 [Technical requirements](#) for flood risk [mapping](#)
- 《洪水风险图**成果提交要求**》 Flood risk map results [submission requirements](#)
- 《洪水风险图成果**汇总集成规范**》 Flood risk map [results integration](#) specification
- 《流域、省级洪水风险图**管理与应用系统技术要求**》 Technical requirements for river basin and provincial flood risk map [management and application system](#)
- 《洪水风险图**地图服务接口规范**》 Flood risk map [service interface specification](#)
-

建立了较为系统完整的洪水风险图编制技术规范体系
A relatively systematic and complete technical specification system for flood risk mapping is established



四、城市洪水风险图编制 4. Urban flood risk mapping

- 形成了与国外水平相当的、覆盖所有洪水类型的通用化洪水风险分析和洪水风险图绘制与管理的自主软件体系

An independent software system for generalized flood risk analysis, flood risk mapping and management covering all types of floods has been developed, which is comparable to the foreign software level.

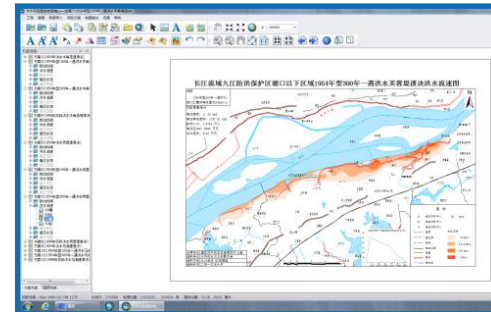
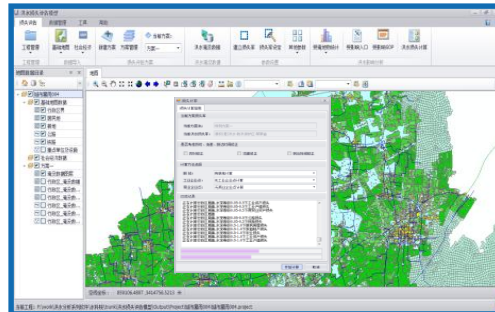
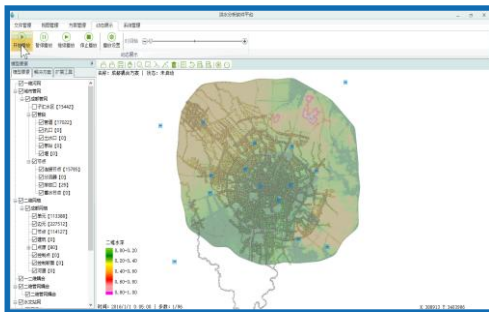
洪水风险图编制通用技术平台 General Technical Platform for Flood Risk Mapping

洪水分析软件
Flood analysis software

损失评估软件
Loss assessment software

风险图绘制系统
Flood risk mapping system

管理与应用系统
Management and application system



四、城市洪水风险图编制 4. Urban flood risk mapping

✦ 2013-2015年，全国重点地区洪水风险图项目中开展了45座城市，1.3万km²的洪水风险图编制，从城市外洪、内涝进行风险分析，绘制风险图。

From 2013 to 2015, flood risk mapping of 45 cities with area of 13,000 km² was completed, including flood risk analysis of external flood, urban waterlogging, and flood risk map drawing.

✦ 全国共85座重点或重要防洪城市，已编制41座。

41 cities have been finished the flood risk mapping task during 85 key or important flood control cities.

方案类型 Type of flood analysis schemes	方案总个数 Number of schemes
水利标准暴雨内涝（5、10、20、50、100年一遇） Rainstorm waterlogging (5, 10, 20, 50, 100 year return period)	855
市政排涝标准内涝（1、2、3、5、10年一遇） Municipal drainage standard waterlogging (1, 2, 3, 5, 10 year return period)	
历史典型暴雨内涝 Historical Typical Rainstorm Waterlogging	
超标准洪水（外洪） Over-standard flood	

四、城市洪水风险图编制 4. Urban flood risk mapping

- ✦ 城市洪涝实时分析模型、城市动态洪水风险图、城市洪涝监测预警决策支持系统等是目前的研究热点和趋势。

Urban flood [real-time analysis model](#), urban [dynamic flood risk map](#), urban flood monitoring and [early warning](#) decision support system are the current research hotspots and trend.

- ✦ 以水文-水动力洪涝分析模型为核心，通过与水文、气象预报数据相关联，快速开展洪涝实时预报模拟计算，实现对洪涝风险的自动触发、滚动计算和动态预测，为城市防汛决策提供支撑。

With the hydrological-hydrodynamic flood analysis model as the core, the real-time flood forecasting simulation calculation is carried out rapidly by associating with [hydrological and meteorological forecast data](#) to realize the automatic start, rolling calculation and dynamic prediction of flood risk, providing support for urban flood control decision-making.

汇报完毕！敬请指正！

THANKS!



中国水利水电科学研究院

China Institute of Water Resources and Hydropower Research



水利部防洪抗旱减灾工程技术研究中心

Research Center on Flood & Drought Disaster Reduction of the Ministry of Water Resources