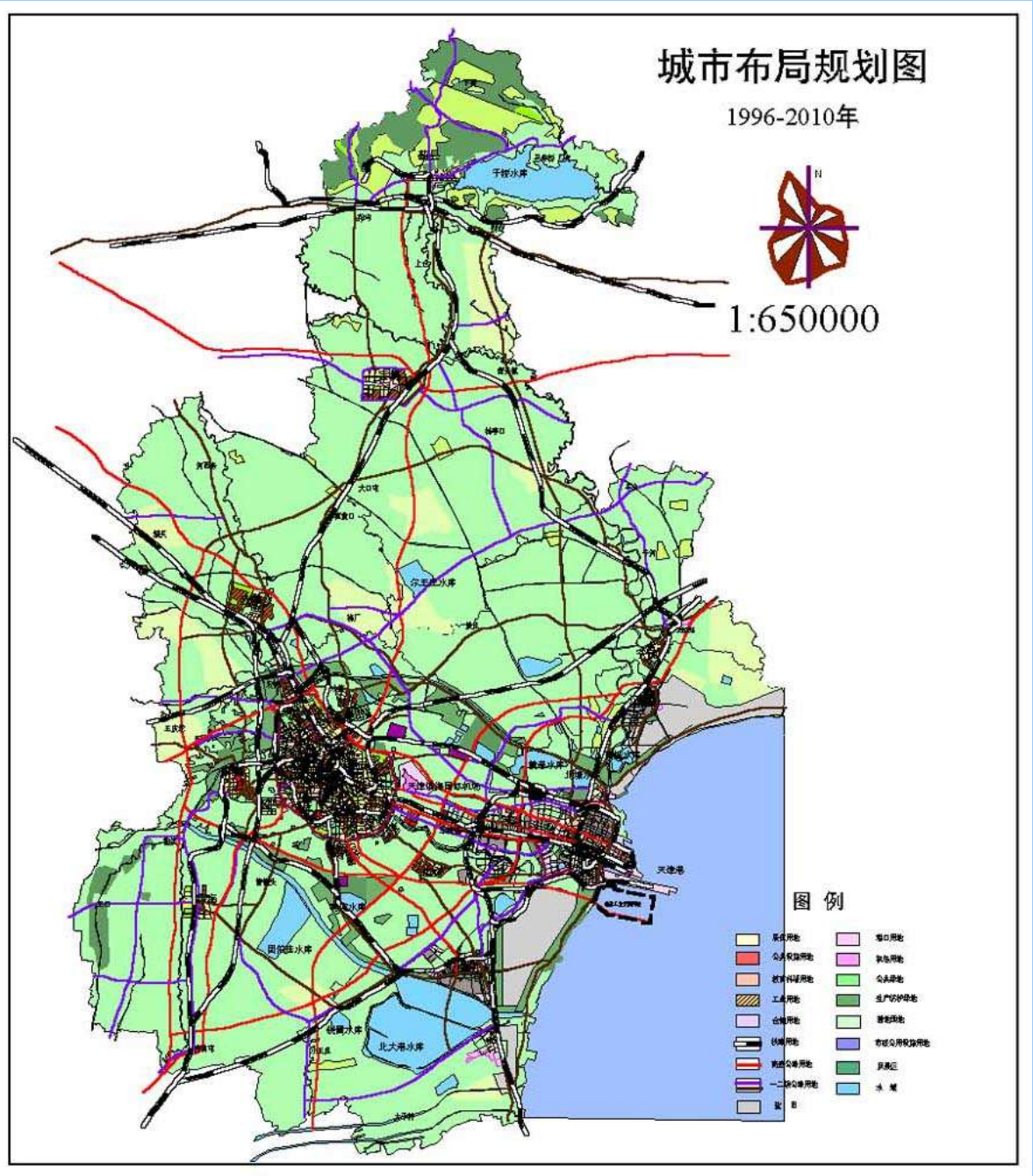# The Technical Support System of Ambient Air Quality Management in Tianjin

TIANJIN

One of the important economic centers and ports in the north of China

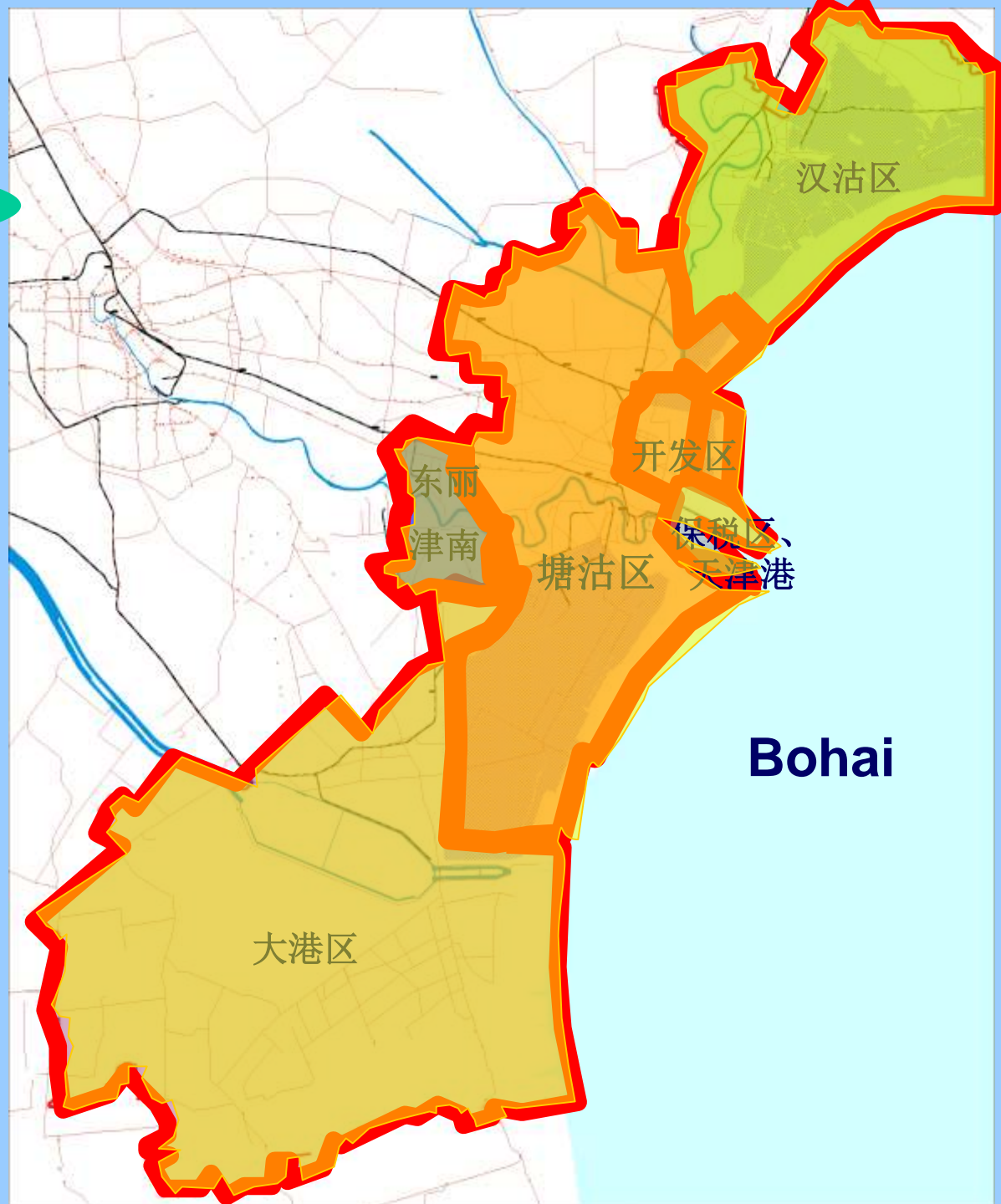Total area: 11919 km^2
Built-up area: 371 km^2
Population: 10 million
Binhai new area of Tianjin (BNAT): 350km^2

城市布局规划图
1996-2010年
1:650000
图 例

position of BNAT

BNAT is located at
Bohai Bay Rim city
belt with an area of
2270 km2

The area of planed
key construction:
350km^2.

汉沽区

开发区

东丽
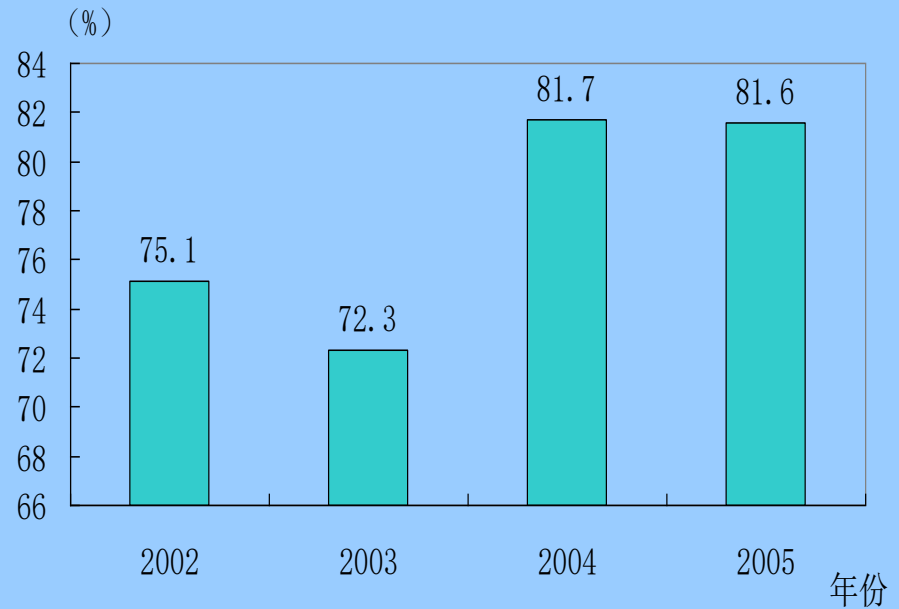
津南

保税区、
天津港

塘沽区

Bohai

大港区

- **Background**
- **Objectives and meanings**
- **Content**
- **Technologies**
- **Basis**

Background

- Tianjin was granted the title of "National Model City of Environmental Protection" in 2005
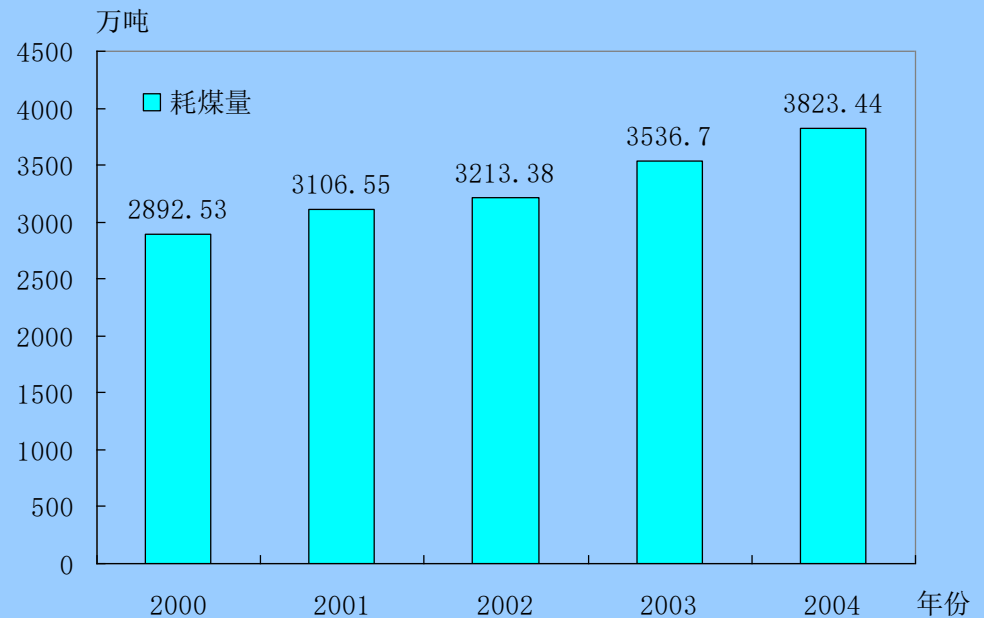
（%）

The percentage of days attaining grade II of the ambient air quality standard during 2002-2005

Background

- Under the rapid economic development and increasing energy consumption, the Tianjin air quality is fragile.

The coal consumption during 2000-2004

Background

The haze haunted the sky of Tianjin under the disadvantageous meteorologic conditions.
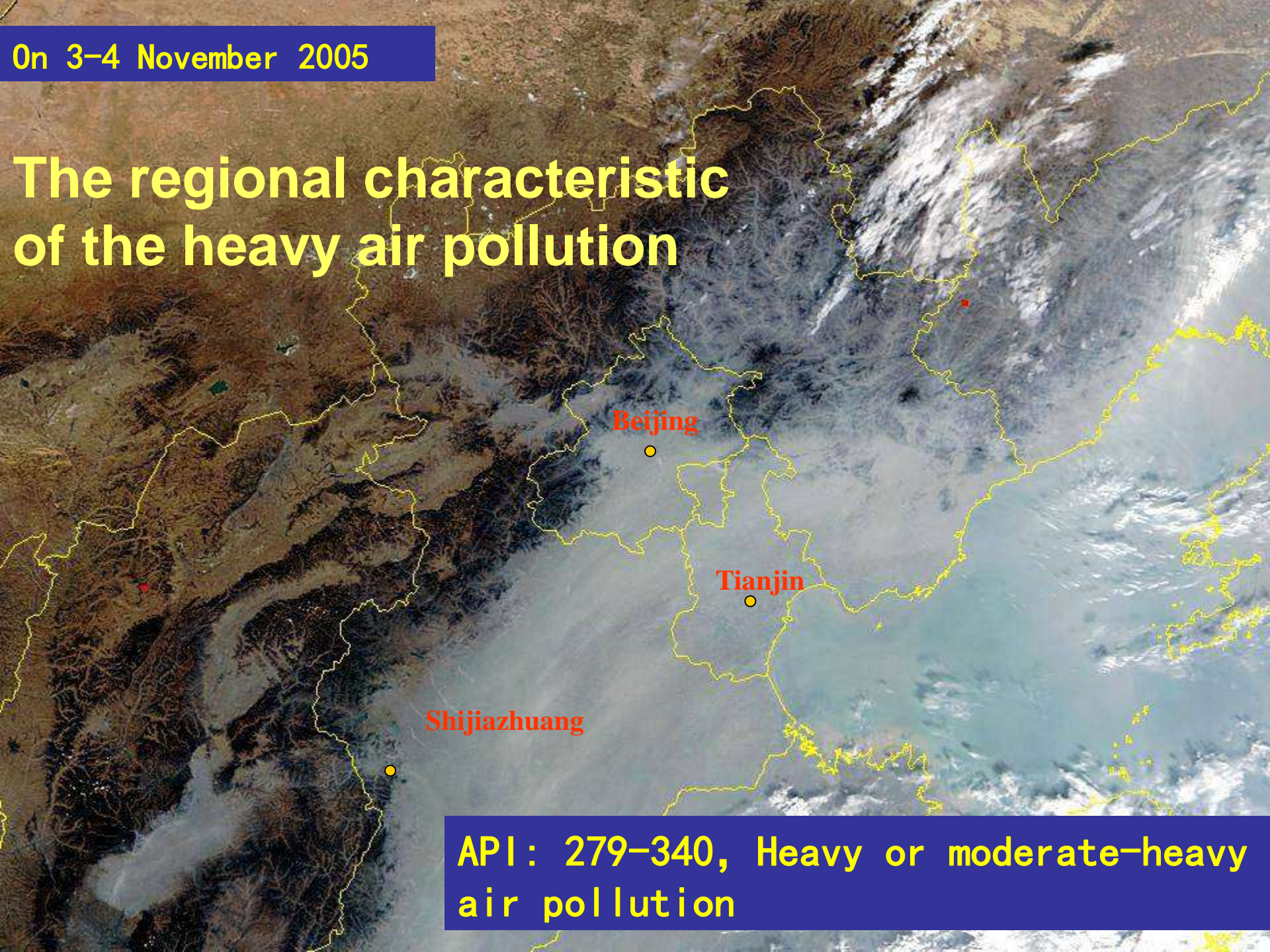
Tianjin had a bad air quality on 2-7 November 2005.

- 1 day of heavy air pollution with API of 340
- 2 days of moderate-heavy air pollution with API of 267-279
- 2 days of light heavy air pollution with API of 191-155
- 1 day of slight air pollution with API of 113

On 3-4 November 2005

The regional characteristic of the heavy air pollution

Beijing

Tianjin

Shijiazhuang

API: 279-340, Heavy or moderate-heavy air pollution
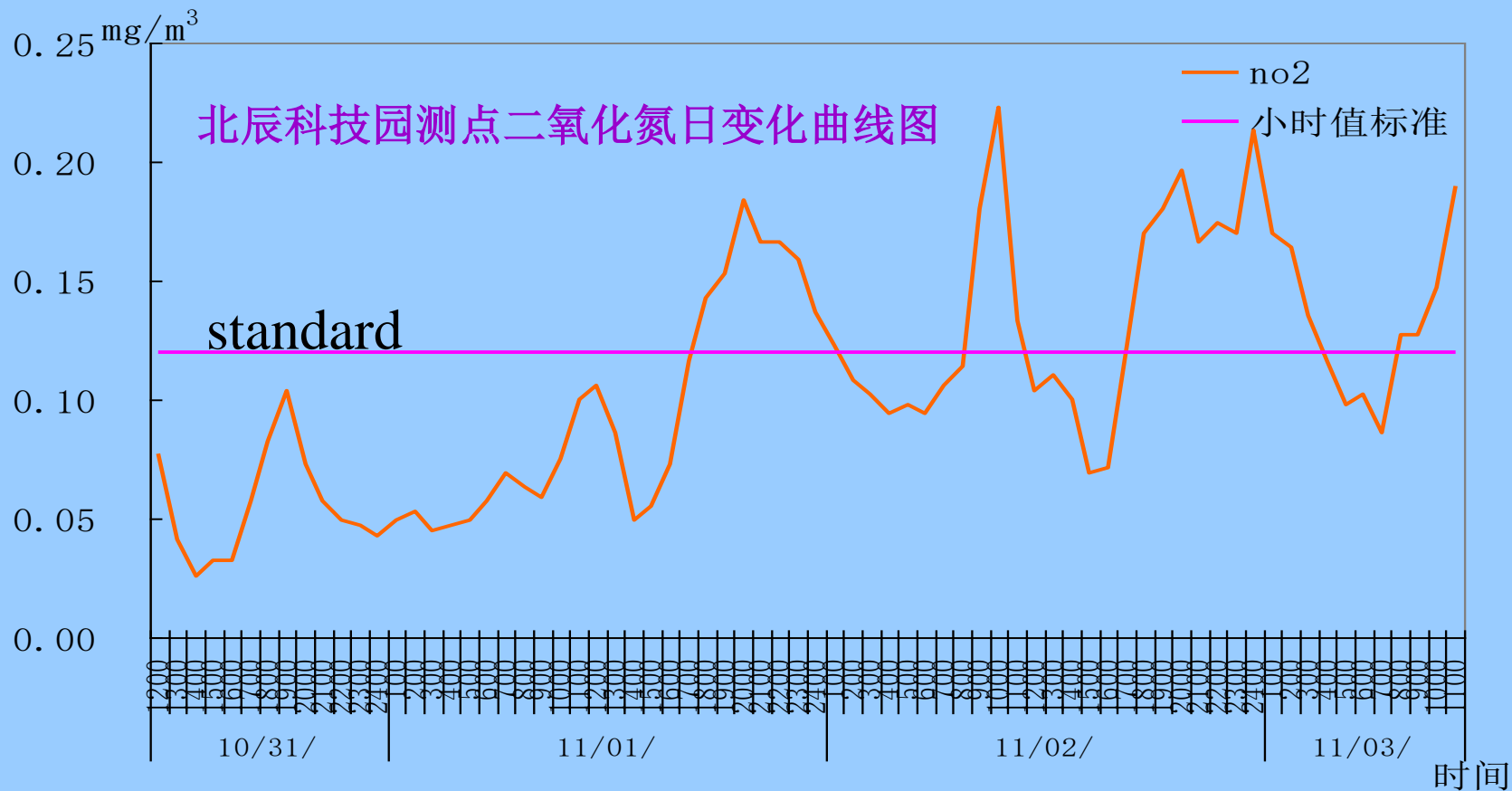
Background

The smoke pollution caused by coal burning hasn't resolved yet, the urban air pollution has begun to transform from smoke-type to complex-type, which is marked by the emergence of new pollutants such as aerosols, fine particle matters, ozone and so on.
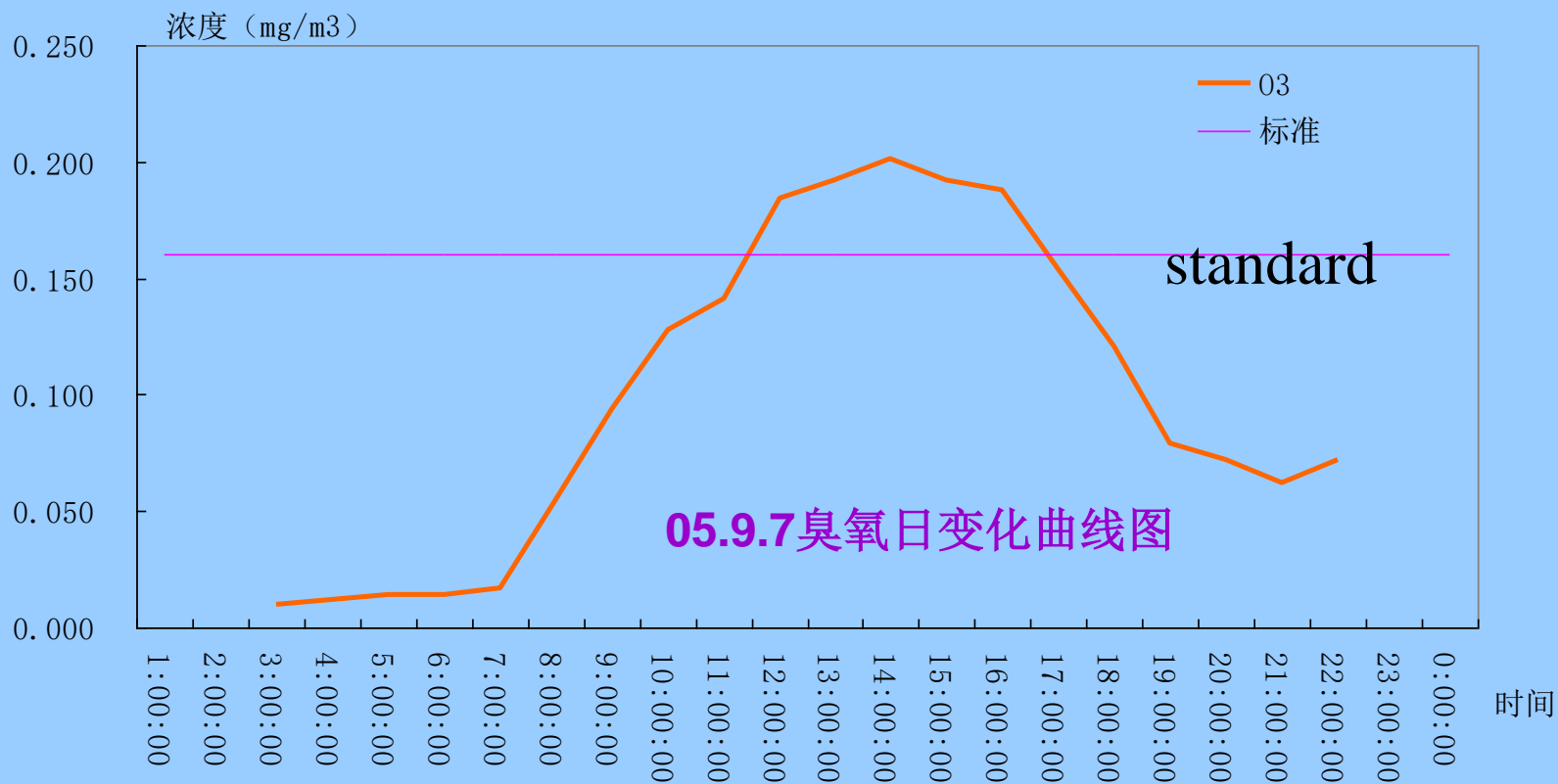
TIANJIN CENTRAL URBAN AREA

Background

北辰科技园测点二氧化氮日变化曲线图

The daily change of NO2 concentration

Background

05.9.7臭氧日变化曲线图

standard

Ozone pollution is emerging with the rapid increase of vehicle ownership

Project meanings

- It is a big challenge for Tianjin to keep the good urban air quality

- **Maintain the model city of environmental protection**
- **Continuously improve the urban air quality**
- **Realize the plan of "Blue Sky Project"**
- **Ensure the constant rate of attaining standard**
- **Provide the environmental administrative departments with scientific and accurate pre-warning pollution information**
- **Endeavor to fulfill the goal of ecological model city**

Project meanings

- Meet the scientific, informative, quantitative and legal requirements of air quality management.

- Establish an integrated system of air quality management involved environment monitoring, forecast and pre-warning and environmental capacity match.

Main content

- Establish Tianjin GIS dynamic assessment database system of air pollution sources.

- Integrated meteorological and geographic factors into the model

- Establish air quality decompose system in order to provide visualized model system of air quality picture

- Establish Tianjin regional ambient air quality and capacity match management system to provide technical support for the air quality management during the 11th Five-Year Plan period

- Establish Tianjin ambient air quality pre-warning and response system

Project Content

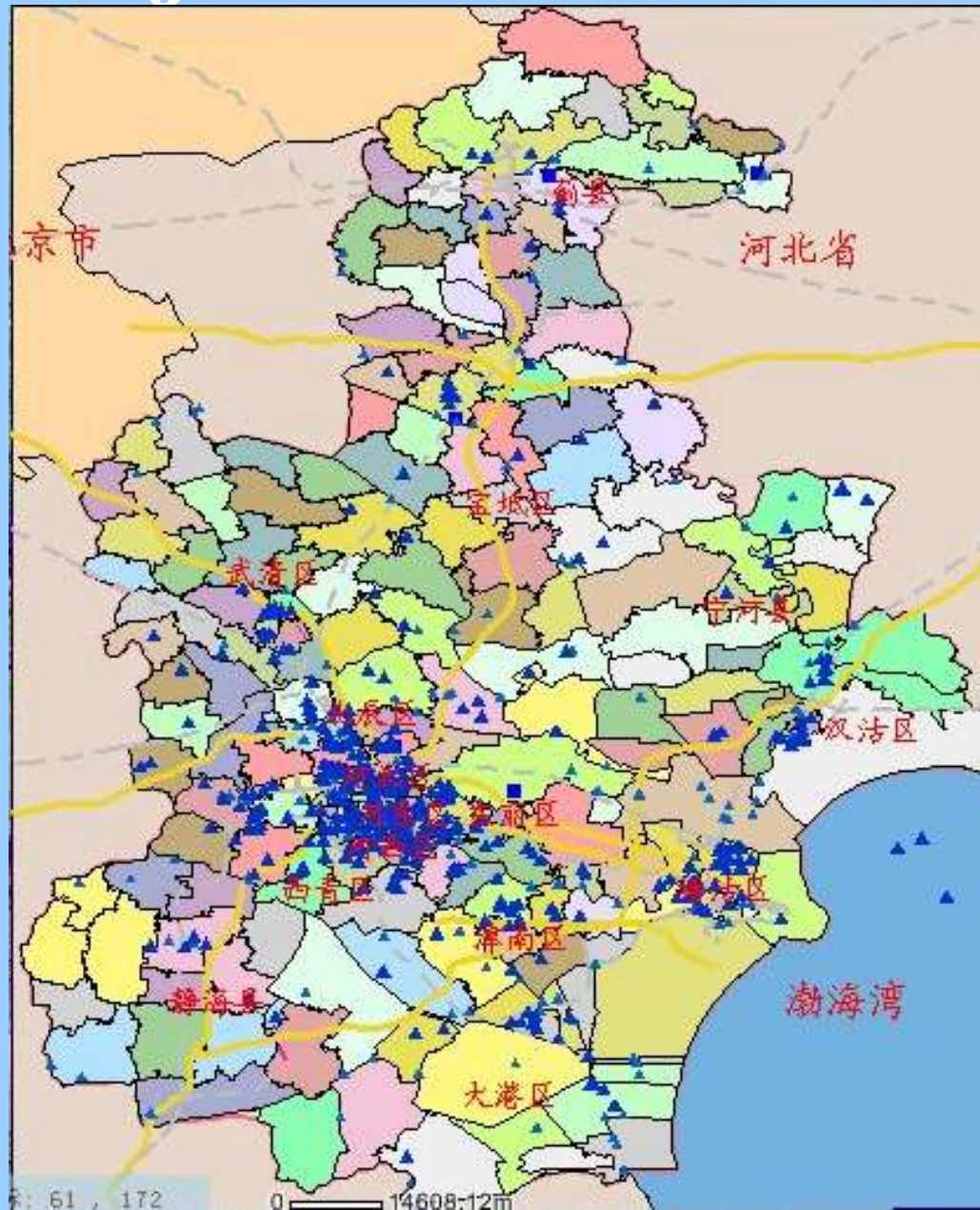❖ The establishment of GIS dynamic management system of air pollution sources

1. Survey on the stationary sources and the establishment of emission inventory for the stationary sources

2. Survey on the mobile sources and the establishment of emission inventory for the mobile sources

3. Survey on the opening sources and the establishment of database for *blown-up dusts as one of the opening sources*

Projects Content

Project Content

❖ <u>The establishment of integrated system of meteorological data</u>

The collection of meteorological data
The integrated system of meteorological data

1. Integration and analysis of various meteorological data;
2. Identification of the weather type affecting the urban ambient air quality;
3. The systematic analysis on the air disperse capacity of Tianjin

Project Content

❖ <u>The establishment of air quality explain and analysis system</u>

a. The establishment of air quality monitoring database

b. Weather-Air Quality model establishment

   By analyzing the weather characteristic of the heavy air quality day (e.g. the haze weather), the countermeasures can be selected under such weather condition.
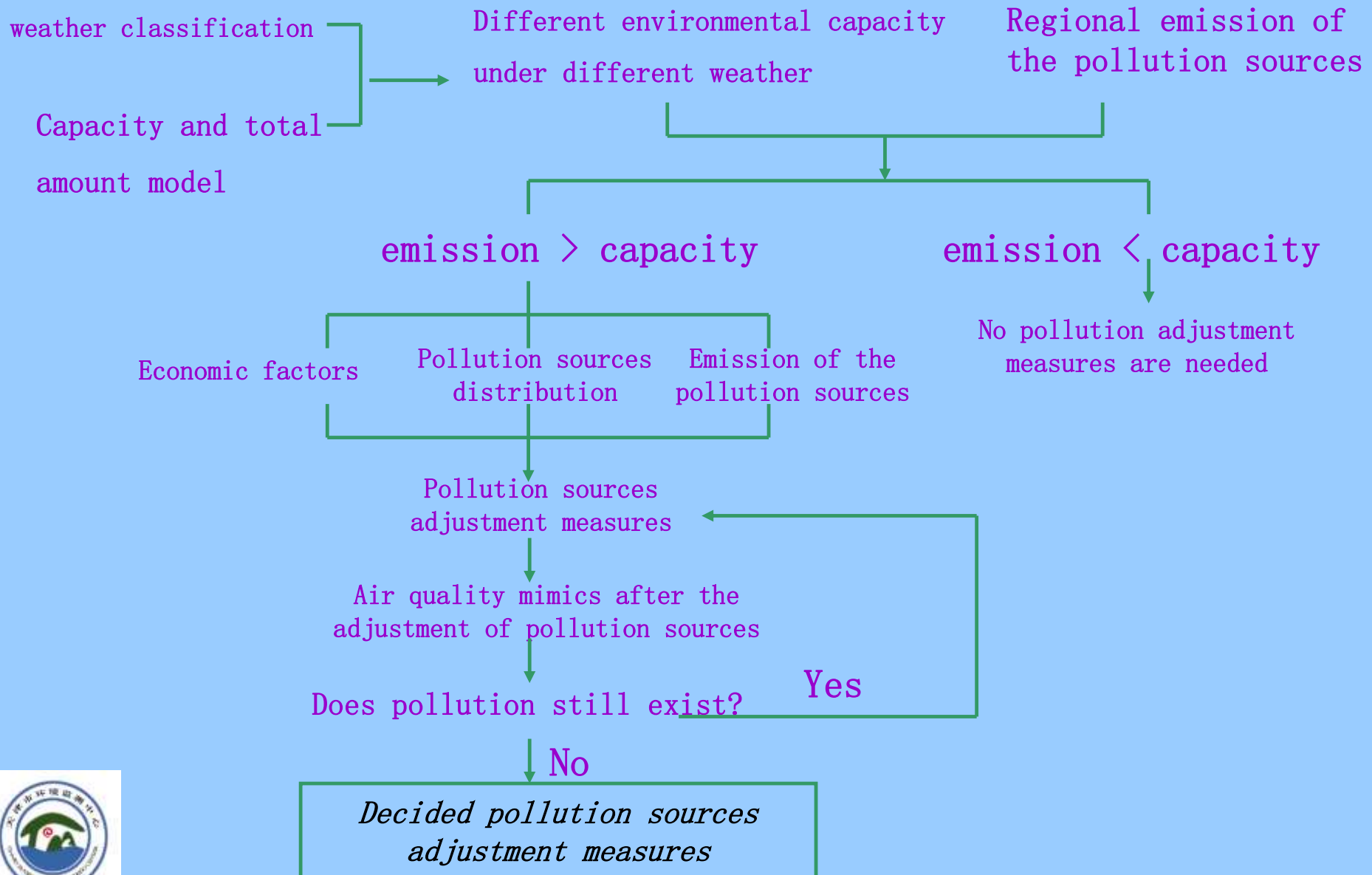
Project Content

The regional ambient air quality capacity and total amount distribution management system

- Based on the dynamic ambient air capacity, considering the allowable emission amount of various pollution sources under a certain meteorological conditions, a reasonable pollution emission distribution can be designed from the autonomous adjustment of pollution sources of the model.

Project Content

weather classification

Capacity and total

amount model

Different environmental capacity
under different weather

Regional emission of
the pollution sources

emission > capacity   emission < capacity

Economic factors   Pollution sources   Emission of the   No pollution adjustment
distribution   pollution sources   measures are needed

Pollution sources
adjustment measures

Air quality mimics after the
adjustment of pollution sources

Does pollution still exist?   Yes
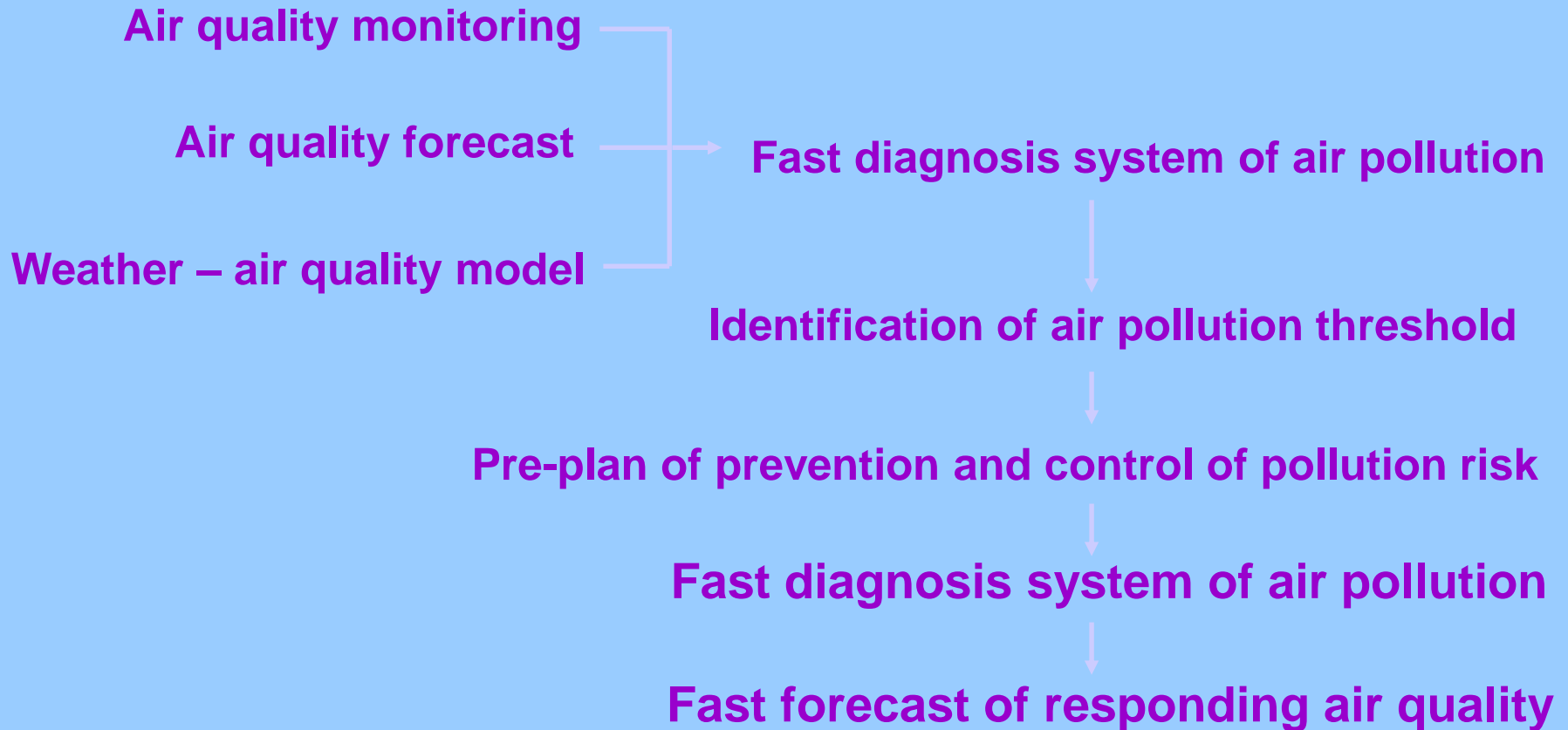
No

Decided pollution sources
adjustment measures

Project Content

Tianjin air quality pre-warning system

1. *Identify air pollution thresholds under certain weather conditions*

2. *Find out the major pollution sources by operating the model*

3. *Provide plan of prevention and control of pollution risk*

Project Content

Air quality monitoring

Air quality forecast → Fast diagnosis system of air pollution

Weather – air quality model

Identification of air pollution threshold

Pre-plan of prevention and control of pollution risk

Fast diagnosis system of air pollution

Fast forecast of responding air quality

Project basis

Major research projects related to ambient air quality in recent years:

- The research on forecast of Tianjin air pollution;
- The research on PM source apportionment and environmental information management system;
- The pilot research on assessment methods of urban vehicle emission pollution;
- The application research of air quality forecast methods in Binhai area;
- The research on assessment of the implementation effects of Tianjin "Blue Sky Project"

The ongoing researches related to ambient air pollution control

- Tianjin air pollution risk assessment, pre-warning and forecast system

- The research on Tianjin ozone pollution level and measures of prevention and control

- **Main technical requirements:**

- Pollution source inventory and the method for establishing sources database ;

- The assessment methods and application of technologies

Thank You