

Applying ISO 19100 Standards for Geographic Information Standardization in China

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- 1. Brief Overview of Implementing Geographic Information Standards in China**
- 2. Action for Introducing ISO/TC 211 19100 standards to China**
- 3. Creating Some National Standards Referencing ISO/TC 211 CDs**



(1) Brief Overview of Implementing Geographic Information Standards in China



Geographic information standardization has been recognized as a very important component at the beginning of GIS developing in China early 80's.

As one of key projects, it has been placed on the **national research plan** and **national standard working-out plan**.



Before participating activities of ISO/TC 211 in 1995, China was stand alone for working-out national geographic information standards, except cooperation research with a few countries, such as USA.



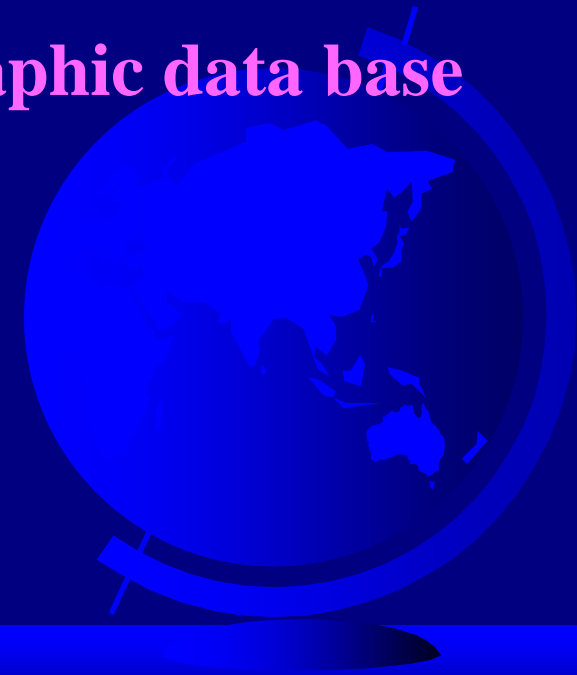
Some national standards had been worked out, such as:

- **Geographic Grid**
- **Classification and Codes for National Fundamental Geographic Information**
- **Classification and Codes for Forest Resources**
- **Coding System for River Names of China**
- ...



Research on more standards related to:

- **Data quality control and estimation**
- **Digital photogrammetry and digital cadastral**
- **Symbol system for digital mapping**
- **Data dictionary**
- **Technical linkage between topographic data base and geographic names data base.**
- **Data transfer format**
- **...**



Problems:

- **The national standards are not structured**
- **The scope of national standards is rather narrow**
- **There is a gap between China and the international for geographic information standardization**



**(2) Action for Introducing ISO/TC
211 19100 standards to China**



1. Organizations for Geographic Information Standardization

The National Technical Committee of Geographic Information Standardization (CSBTS/TC 230) was found in 1997.



CSBTS/TC 230 is in charge of creating national standards, including planning, research, working-out and testing all new national standards and revising existing standards in China.



One of the commissions of the Chinese Association for GIS , the Commission of Standardization and Quality Control was found in December 1994.



2. There are more than **40 organizations** take part in the activities related to ISO/TC 211 in China.

Expert Groups relevant to the 5 working groups of ISO/TC211 have been formed. The responsibility of these groups is reviewing and discussing ISO/TC 211 draft documents and make comments.



3. Introduce ISO TC 211 standards and their implications to the Chinese geographic information community, to facilitate the development and implementation both national standards and product standards or product specifications.



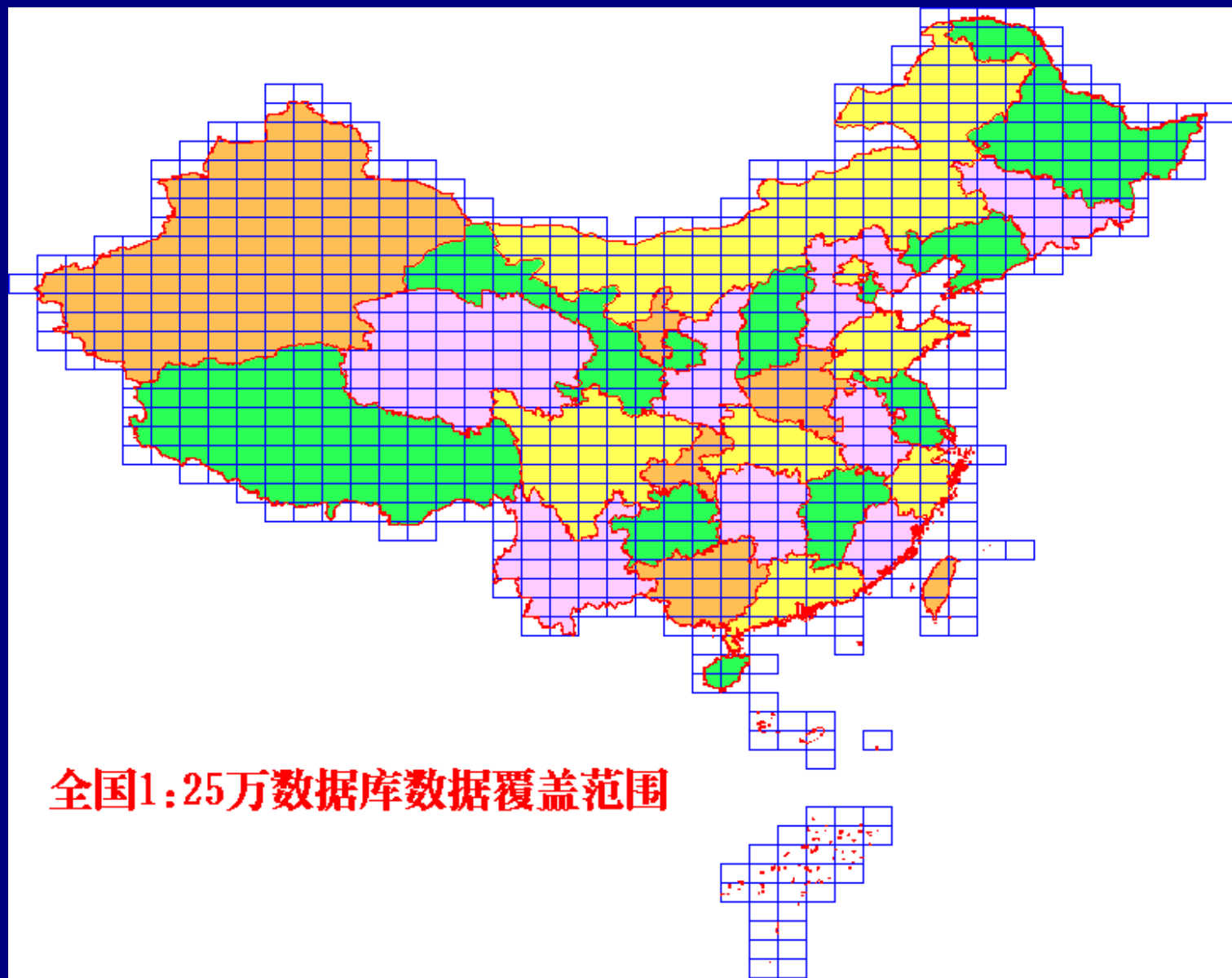
Documents of ISO 19100 standards will be translated into Chinese partly, to let more people understanding them, such as officers, researchers, students and geographic information industry.



4. Some drafts of ISO/TC 211 standards have been used for special projects, such as:

- the 19113 and 19114 CDs were used for data quality control of the 1:250,000 database of the NFGIS**





Index of 1:250,000 Database of the NFGIS

- the 19115 CD was used for the national key project “**Sharing of Sustainable Development Information in China**”, the NFGIS databases, databases of land and resources, etc.





专题介绍

专题进展

单位介绍

NFGIS

标准研究



中国可持续发展信息共享示范 - 国家“九五”科技攻关项目

标准化与规范化和 公共基础地理信息共享平台

97-925-01-02

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**Sharing of Sustainable Development Information in China
(Web site of its sub-node for standardization)**

(3) Creating Some National Standards Referencing ISO/TC 211 CDs



1. Using ISO 19110 for revising the national standard “Classification and Codes for National Fundamental Geographic Information”

feature type

feature attribute

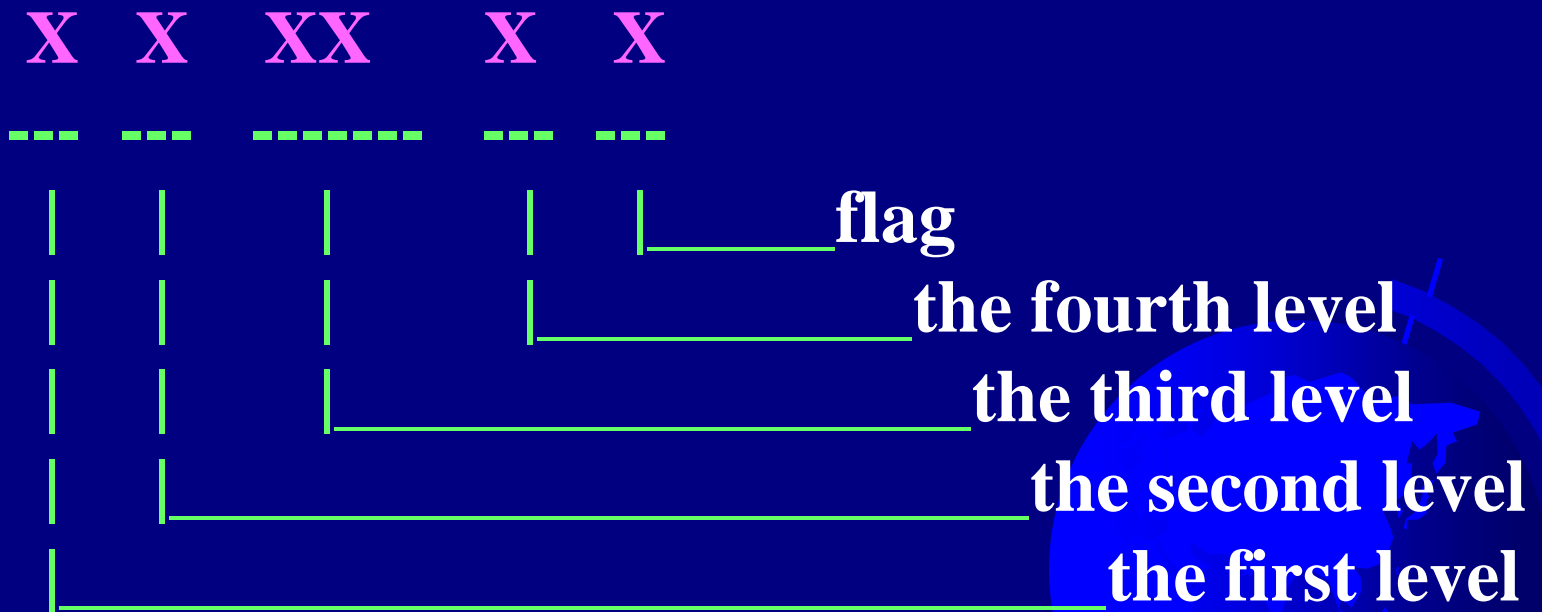
feature relationship

feature operations

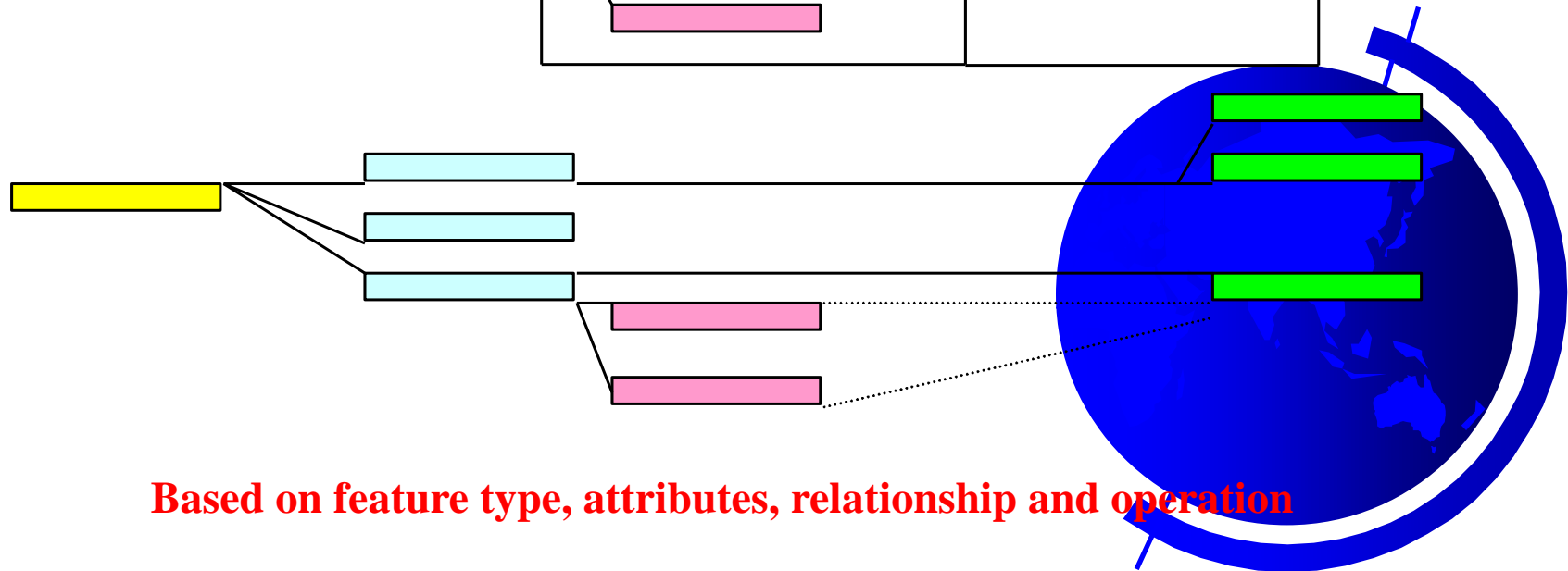
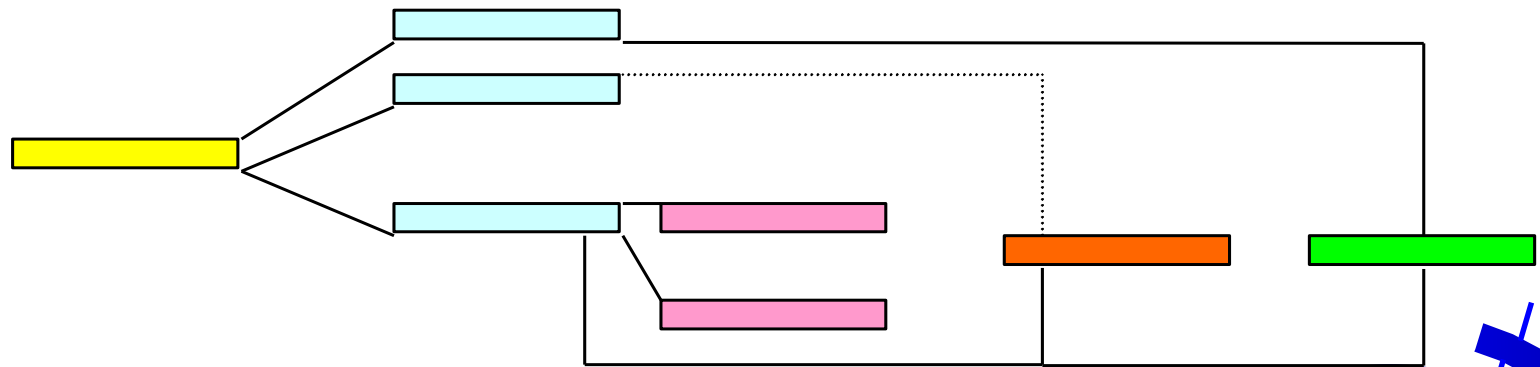
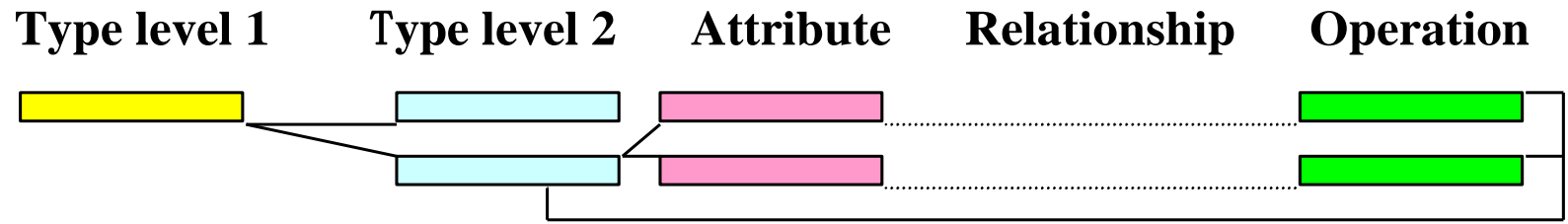


Classification and Codes for National Fundamental Geographic Information

(GB/T 13923-1992)



Based on feature type and partly on attributes



2. The national standard “Data Quality Control” is being developed with relation to the ISO 19113 and 19114 standards.

quality elements

data quality evaluating

data quality reporting



Data Quality Control

1. Data Completeness ,including:

- Coverage Completeness
- Data layer Completeness
- Attribute Completeness
- Feature Completeness

2. Logical consistency, including:

- Attribute consistency
- Format consistency
- Layer consistency
- Topological consistency
- Feature relationship consistency



Data Quality Control (Cont.)

3. Positional accuracy, including:

- Absolute accuracy of points, lines and polygons
- Relative accuracy of points, lines and polygons
- Generalized polygon shape comparability

4. Attribute accuracy, including:

- Classification correctness
- Qualitative attribute correctness
- Quantitative attribute accuracy

5. Edge matching, including:

- Edge positional matching
- Edge attribute matching



Data Quality Control (Cont.)

6. Temporal accuracy, including:

- Temporal consistency
- Temporal currency
- Data capture time

7. Lineage and document completeness, including:

- Metadata
- Lineage
- Design document
- Other documents



**Content of data quality control is company
with the relevant ISO/TC 211 standards**

Data quality control methodology:

Drawn up

Tools

Interactively

Data quality control report



3. ISO 19115 is the basis for working-out the national standard “Geographic Information Metadata”.

core metadata

full metadata

codelists and enumerations

metadata extension rules



An example of Metadata level one (a part)

METADATA (LEVEL ONE)

---FOR THE 1:1M-SCALE TOPOGRAPHIC DATABASE OF THE
NATIONAL FUNDAMENTAL GEOGRAPHIC INFORMATION
SYSTEM OF CHINA

CATALOGUING METADATA INFORMATION

Title (Chinese): 国家基础地理信息系统全国1: 100万地形数据库

Title (shortened form, Chinese): 1: 100万地形数据库

Title(English): 1:1M-Scale Topographic DataBase of the National
Fundamental Geographic Information System of China

Title (shortened form, English): 1:1M DB (NFGIS, PRC)

Edition: 1.0

Series name: National Fundamental Geographic Information System

Issue identification: The first step

Issue date: 199408



Initiative identification information :

Initiative name : National Fundamental Geographic Information System Networking

Initiative type : Ministry key project

Responsible party information :

Responsible party organization name : State Bureau of Surveying and Mapping

Responsible party individual name :

Responsible party role : Management

Country : People Republic of China

Administrative area : Beijing City

City : Beijing

Postal address : No. 9 Shanlihe Road

Postal code : 100830

Electronic mail address :

Web-site : <http://www.sbsm.gov.cn>

Telephone :

Fax :



Dataset extent:

Geographic extent coordinates:

West bounding coordinate: 72° E

East bounding coordinate: 135° E

North bounding coordinate: 54° N

South bounding coordinate: 3° N

Geographic extent name: People Republic of China

Temporal extent date/time:

Temporal extent type: 1

Temporal 1: 19901231

Temporal 2:

Scale: 1:1,000,000

Resolution:

Language of dataset: Chinese, English



Dataset content information:

Abstract:

Covering entire China. Data contain administrative boundary, reservation, hydrography, railway, road, hypsography, vegetation, etc. The data source is the topographic map at the scale of 1:1,000,000 published in 1980s, with totally 77 map sheets. Data are divided into 17 layers.

Purpose:

As a common platform for locating all kinds of thematic data for governments, organizations, institutions, agencies and so on; for compiling small scale maps in digital or simulative form.

Progress code: Complete

Theme name: Surveying and Mapping

Keyword (s): Surveying and mapping Fundamental information
Geography spatial data Database GIS NFGIS



数据集联系信息: (M) +

CI_负责方 +

主要的负责方信息: +

CI_主要负责方 +

负责部门或个人名称: +

负责的单位名称: (0) 国家测绘局 +

职责: (0, M) 003 +

职责: (0, M) 011 +

联系信息: (M) +

CI_联系 +

电话: (M) +

CI_电话 +

电话: (M) 86-10-68337751 +

传真: (0, M) 86-10-68321893 +

地址: +

CI_地址 +

市(县)内的详细地址: 三里河路9号 +

市(县): (0) 海淀区 +

省、自治区或直辖市: 北京市 +

邮政编码: 100830 +

国家或地区: 中国 +

电子信箱地址: (0, M) CharacterString +

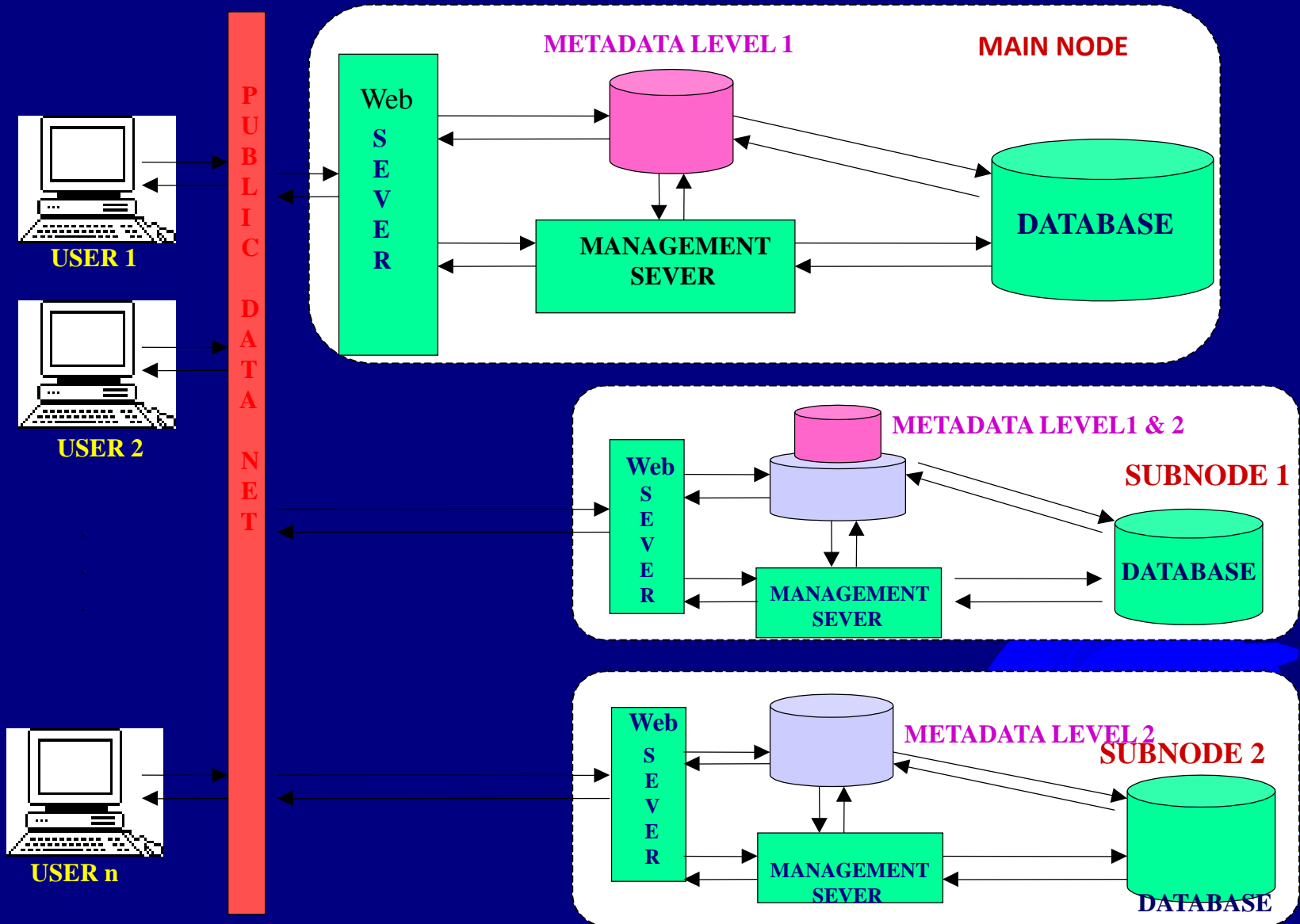
网络资源: (0) +

CI_网络资源 +

网址: (0, M) http://www.sbsa.gov.cn +

+ *静态浏览图信息* (0) +

A part of metadata of the 1:250,000 database



Implementation of Metadata

The Web site is:

<http://nfgis.nsd.gov.cn>



4. The concept of ISO 19101 will be used for developing the **guidelines of standards or **general list**.**

- **Example: Ministry of Land and Resources**
- **It means the reference model will optimize the guidelines of standards or general list in China.**



5. Spatial referencing by coordinates: Here are the referencing systems and datum which will be put in the codelist.

Horizontal coordinate systems:

the Beijing 1954 Coordinate System

the Xi'an 1980 Coordinate System

Vertical datum:

the Yellow Sea Height Datum 1956

the National Height Datum 1985



Codelist of referencing systems of China

No.	Name	Code	Note
1	Beijing 1954 Coordinate System	1	
2	Xi'an 1980 Coordinate System	2	
3	Local Coordinate System	3	



6. Data Identifier Codes, such as:

- **Codes for the administrative Divisions for the P. R. China**
- **Coding System of River Names of China**
- **Coding System of Mountain and Peak Names of China**
- **Name and Number of National Trunk Highway Route**

In fact these are of spatial referencing by geographic identifiers.



Codes for the administrative Divisions for the P. R. China (GB 2260 - 1998)

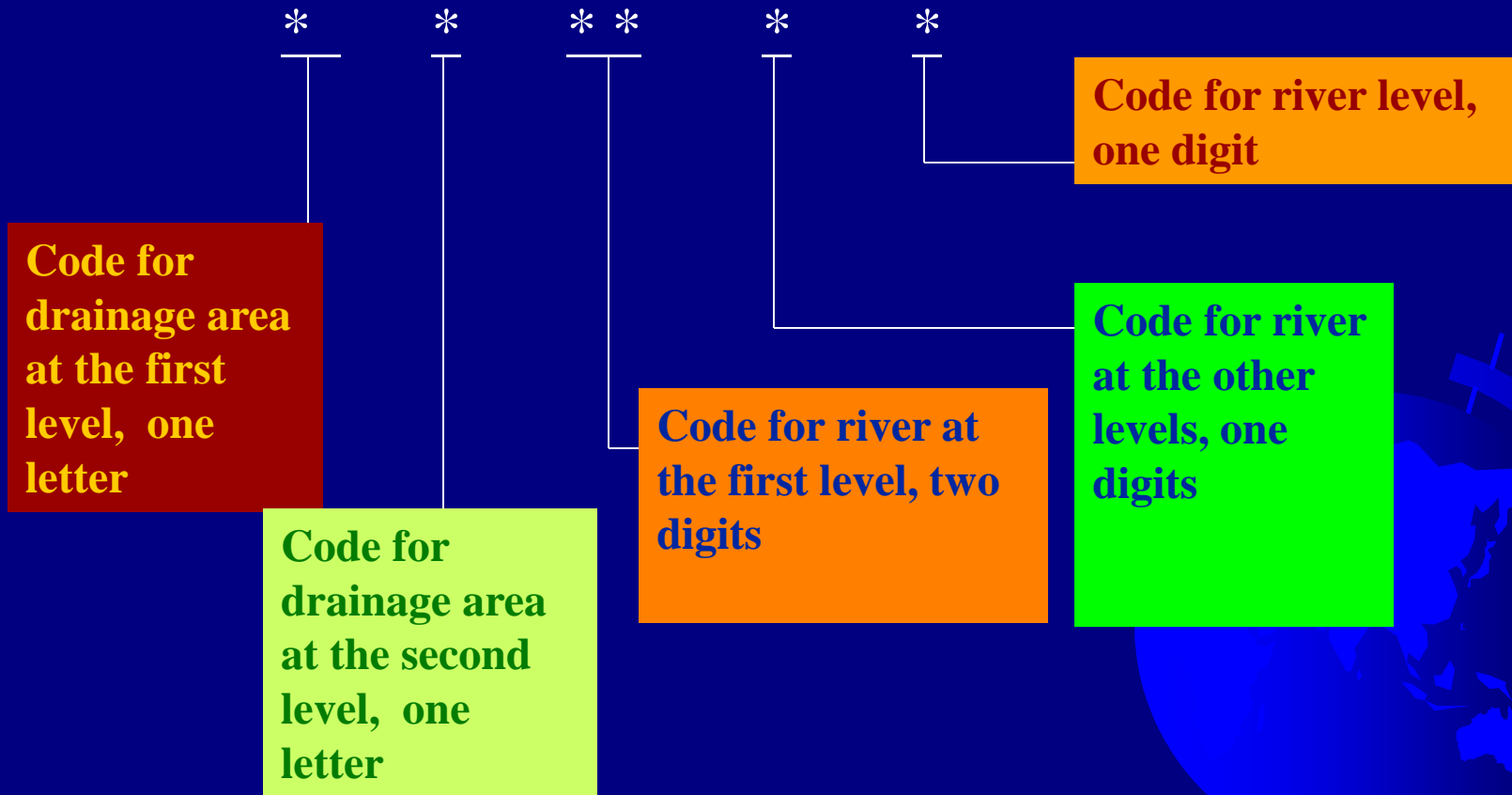
XX XX XX

| | | _____ county sub-code
| | _____ district sub-code
| _____ provincial sub-code



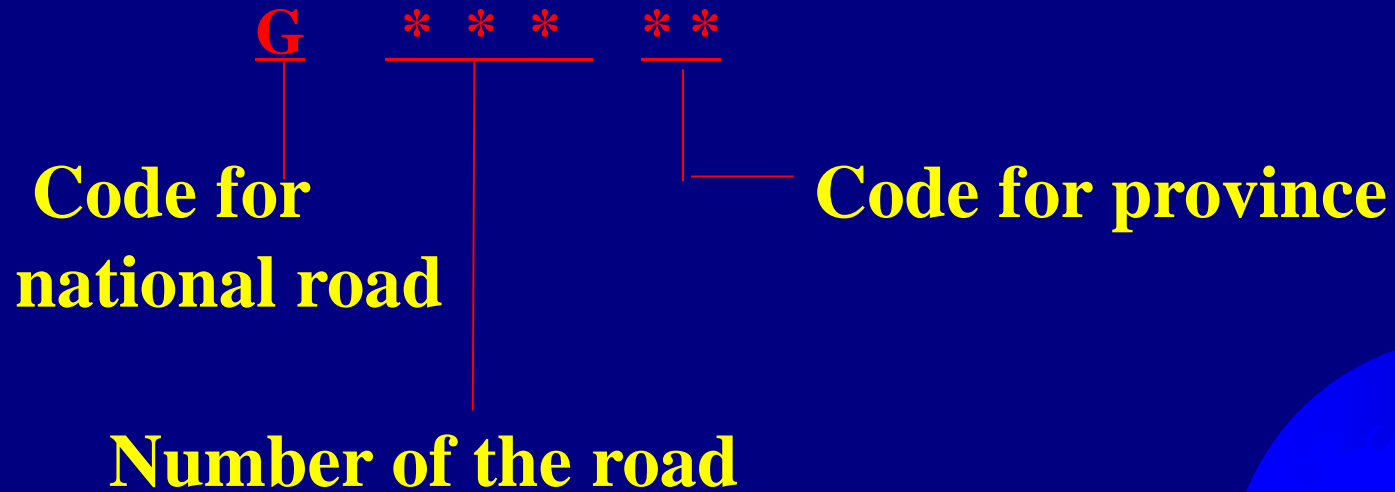
Coding System for River Names of China

(To be approved)



Code for Highway Classification

(GB 917.1 - 1989)



7. ISO 19104 and 19105 will be basis for related national standards.

19104 will be referenced.

19105 will be adapted.

More ISO 19100 standards will be applied in China



8. Issues faced:

- **People are always feel standards are not enough**
- **Different point of view among experts and among organizations have to be hardly coordinated**
- **It is a long way to go through all steps for working out a standard and spent much money**



Issues faced (Cont.):

- **Language obstacle.** It is difficult to understand the implications of ISO 19100 standards sometimes. And some new terms are hardly to translate into Chinese, such as **profile, coverage, portrayal, operation,** and so on, even **geomatcs** it self.



- **General speaking, ISO 19100 standards are useful and valuable. They are very important international standards.**
- **We will make more efforts to enable the acceleration of China's geographic information standards to comply with ISO 19100 standards.**



Thanks for your attention!

