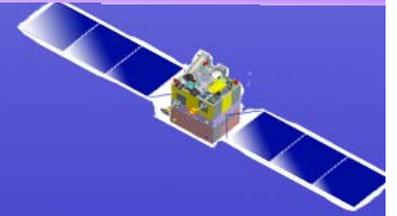


# Surveying and Mapping Capacity Building and Geo-Information Service in China

**Dr. Li, Pengde**

**Deputy to National Peoples' Congress of China**  
**Deputy Administrator, NASG, China**  
**President, UN- GGIM- AP**

2013-2-12



# CONTENTS



**New National Strategy of Geospatial Information**



**Administration and Supervision Mechanism**



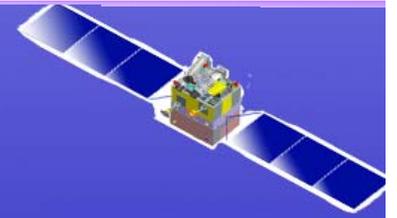
**Geo-Referencing Framework and Geo-Data Resources**



**Development of Science and Technology**



**New Mechanism for International Cooperation**



# 1 New National Strategy of Geospatial Information



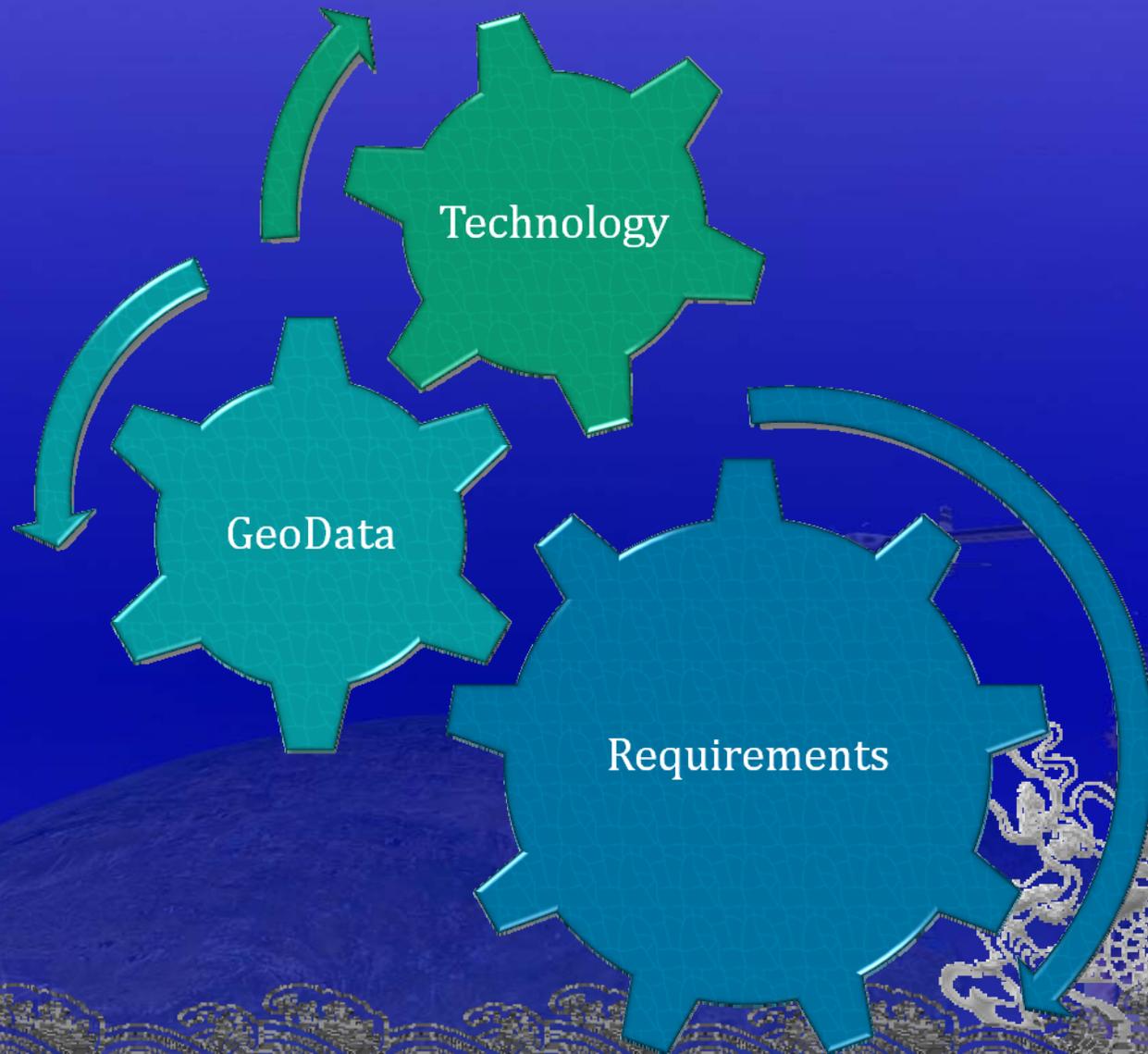


## National development strategy

- The 12th five years plan (2011--2015)
- The 18<sup>th</sup> National Conference of CPC (2012--)
  - Philosophy of Scientific development
  - Five in one development principle:
    - ✓ Economy Construction
    - ✓ Political Construction
    - ✓ Social Construction
    - ✓ Cultural Construction
    - ✓ Ecological Construction
  - Four Modernizations: Industrialization; Informatization; Urbanization; Agricultural Industrialization



# Driving Forces





# National strategy of geospatial information



## 1 Network

- Geo-referencing

## 2 Maps

- Topographic
- Thematic

## 3 Platforms

- Digital City and Smart City
- Geospatial Monitoring
- Map World

## 4 Bolsters

- Administration
- GI Industry
- Human Resource
- S&T Innovation



# Smart China (Smart City)

广东省地理信息公共服务平台 - Windows Internet Explorer

http://192.168.200.80:8719/public/index.phtml

广东省地理信息公共服务平台

文件(E) 编辑(E) 查看(V) 收藏(A) 工具(T) 帮助(H)

广东省地理信息公共服务平台

数字广东 地理信息公共服务平台

空间定位 地图浏览 信息查询 统计分析 互联互通 二次开发 帮助

欢迎您: 部门管理员 [设置] [退出]

数据架 数据架要素数据 数据架影像数据

数据架 数据架要素数据 数据架影像数据

数据架 数据架要素数据 数据架影像数据

玫瑰小学 广福加油站 佛山市电视发射中心 北岭社区居委 季华美食长廊 泰格高尔夫俱乐部 市第一人民医院 玫瑰社区居委会 同济街道办事处 城南街道办事处 启聪学校

x: 38410033.88 y: 2546359.21

米 0 60 120 当前比例尺 1:5000

完成

完成

Internet 100%



# Geospatial Monitoring

- ◆ Monitoring key publicly invested projects
- ◆ Monitoring natural disasters
- ◆ Monitoring land coverage change cycles
- ◆ Providing analysis and service platform

Statistics  
analysis

Geospatial  
change

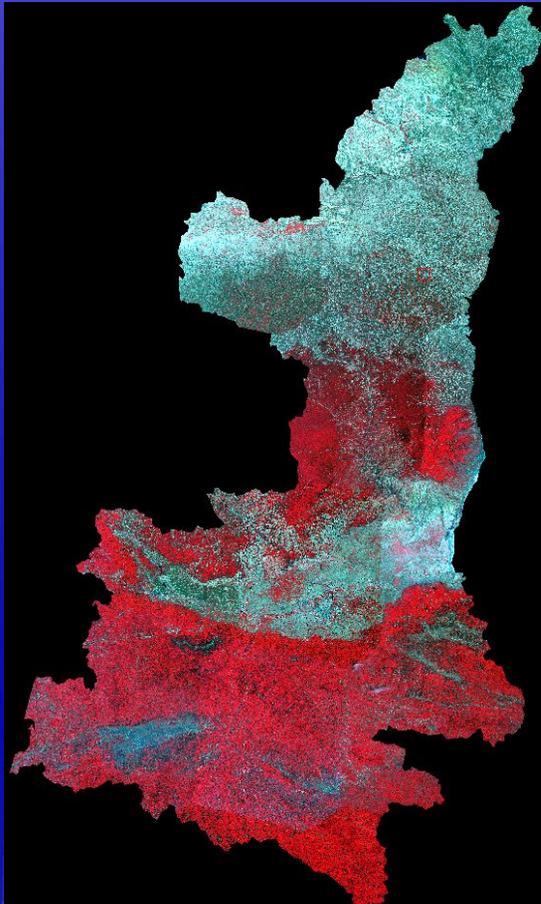
Relationship

Social –  
economic

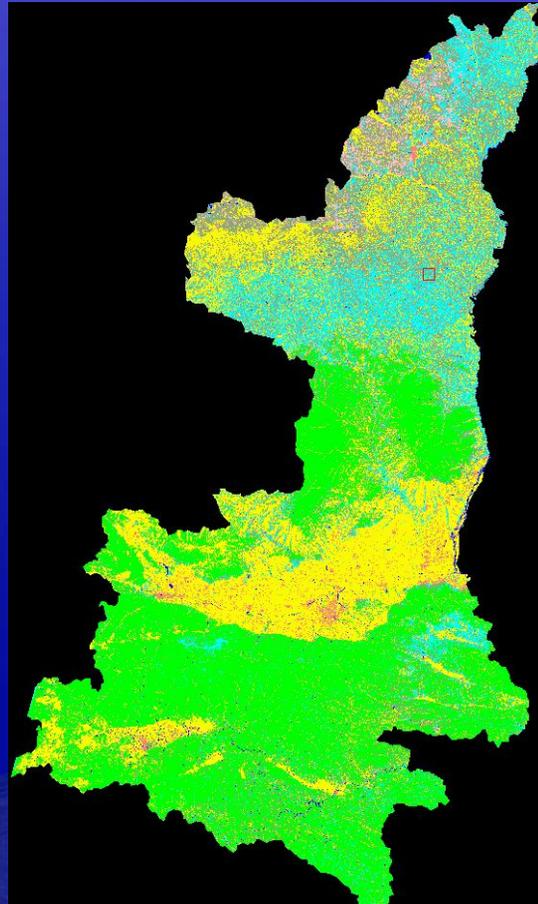
Ecological  
environment



# Global Land Coverage Classification



Shaanxi Province TM (2009)



Classification (2009)

## 图例

- 水体Water
- 居民地Urban
- 农田Cropland
- 裸地Bareland
- 森林Forest
- 灌木Shrub
- 草地Grass
- 未分类Unclassified



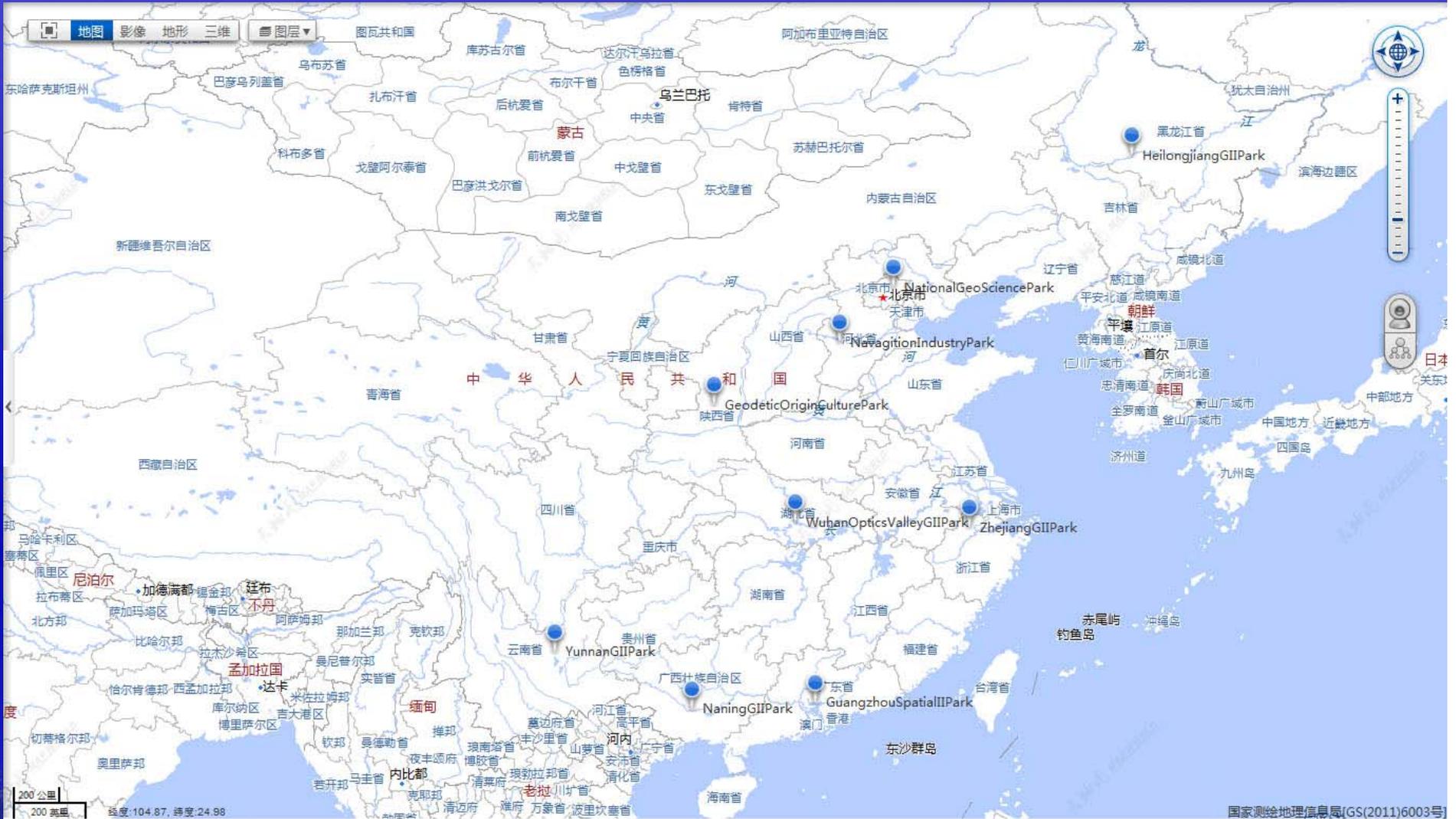
# Geospatial Industry in China

- ◆ 23,000 licensed enterprises
- ◆ 400,000 employees
- ◆ Total output in 2011: RMB 150 billion Yuan
- ◆ Annual growth rate: 25%
- ◆ 10 enterprises in the stock market
- ◆ Geospatial Industrial Parks under construction





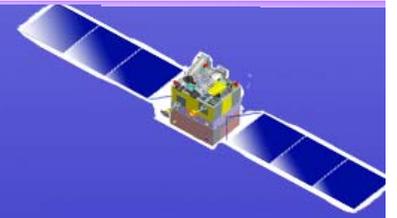
# Geospatial Industry Parks





# A Leading Country of Geomatics





2

# Administration and Supervision Mechanism





# New Name: NASG

国家 测绘 局

State, Surveying and Mapping, Bureau (SBSM)

Surveying  
and Mapping  
Management



Geo-  
Information  
Supervision



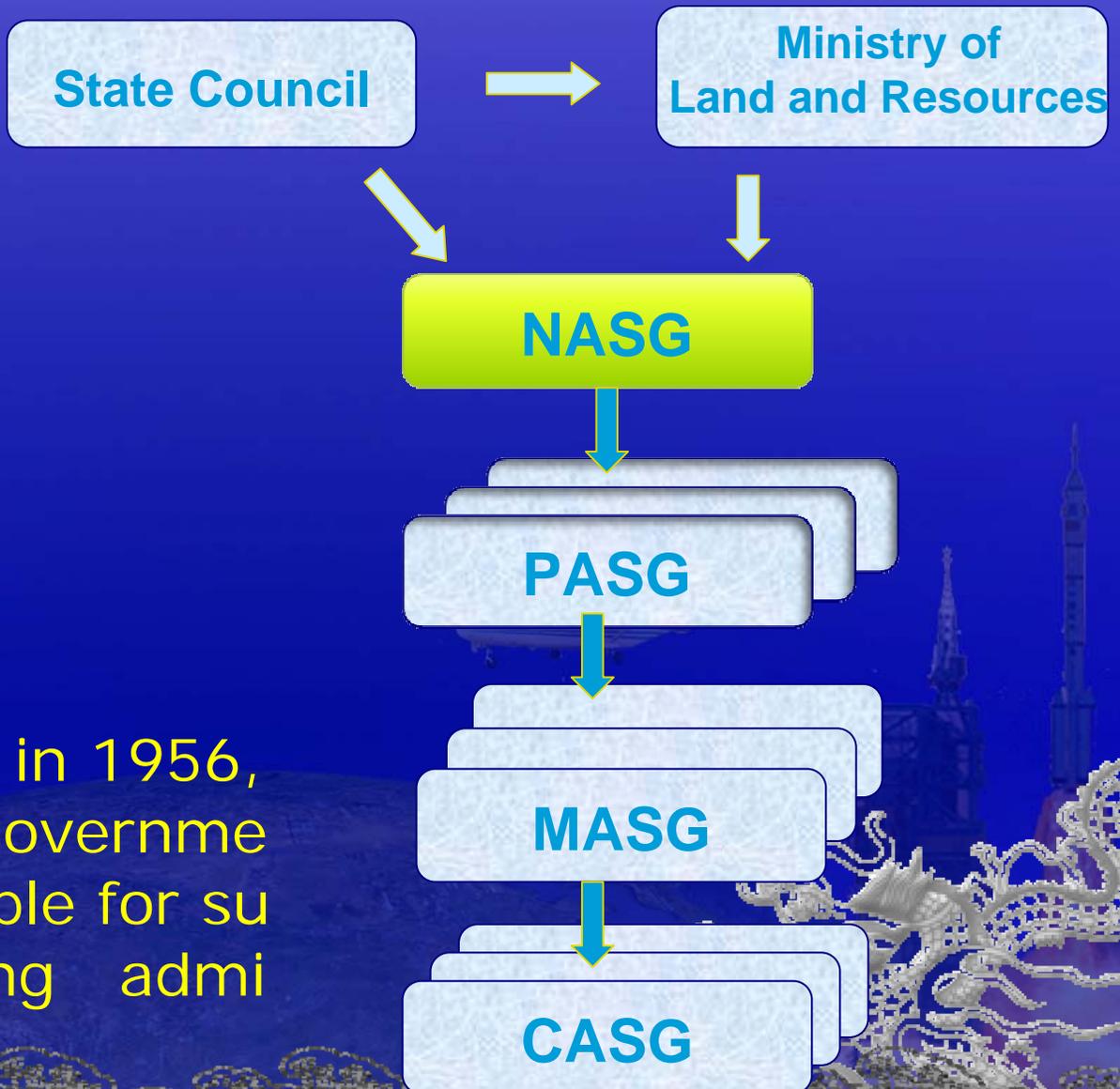
NEW  
NMA

国家 测绘 地理信息 局

National, Surveying and Mapping, Geoinformation, Administration  
(NASG) May 23, 2011



# Organization and Responsibilities



NASG was founded in 1956, SBSM is a central government agency responsible for surveying and mapping administration in China

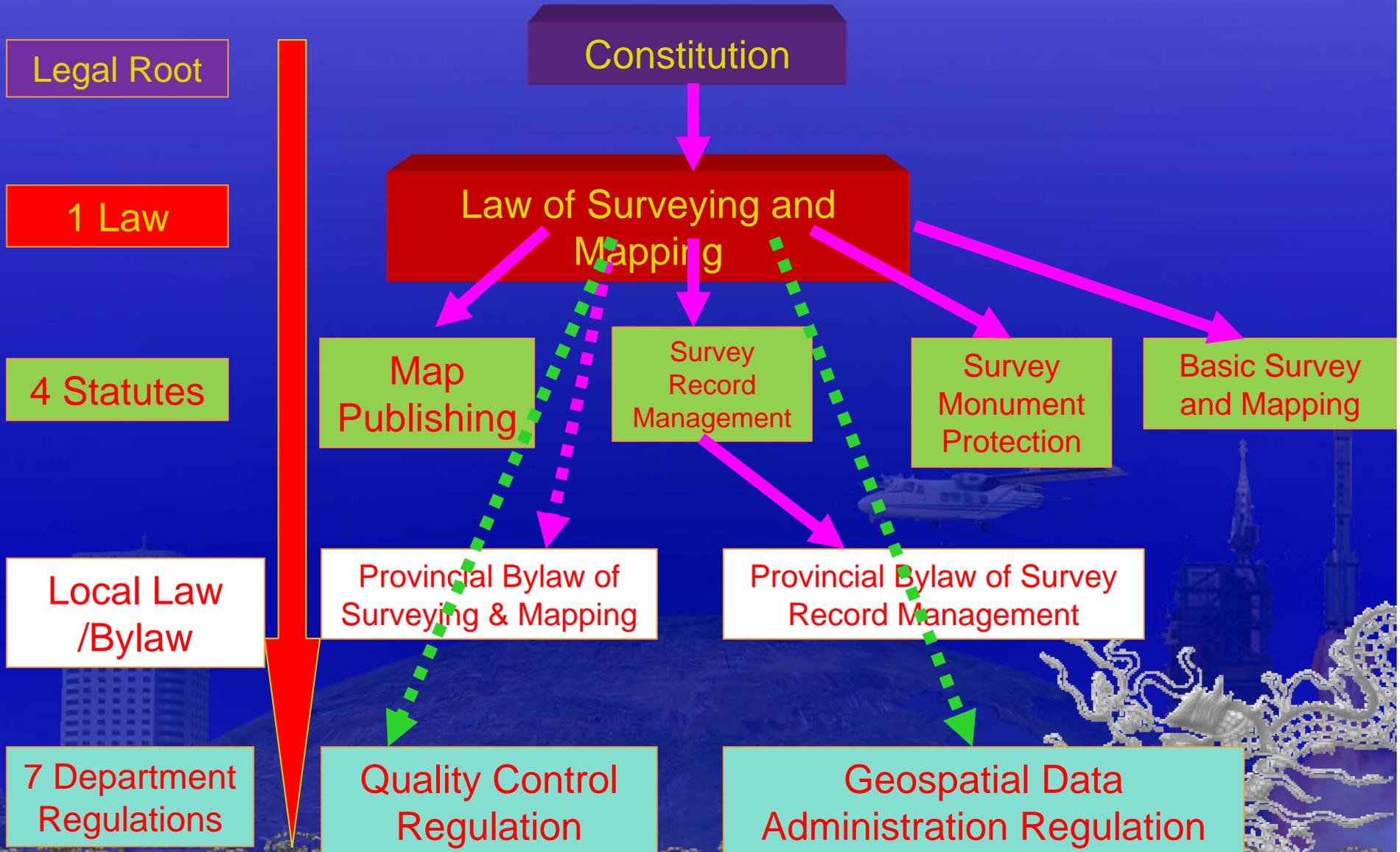


# Main Responsibilities

1. Formulate laws, regulations, development plans, policies and technical
2. Organize and manage basic, boundary and cadastral surveying and mapping and related key projects
3. Establish and maintain national surveying and mapping reference systems
4. Provide public and emergency services
5. Coordinate geomatics industry development
6. Regulate surveying and mapping market
7. Manage national basic surveying and mapping records
8. Administrate map publication
9. Promote technological innovations and international exchanges



# Legal System





# Supervision System

- Registered Surveyor
- Qualified Workers
- Quality Inspector
- Metric Inspector

Personnel

- Hardware Testing
- Software Assessment
- Instrument Calibration
- Annual Inspection

Instrument

- Super Class A
- Class A
- Class B
- Class C
- Class D

Licences

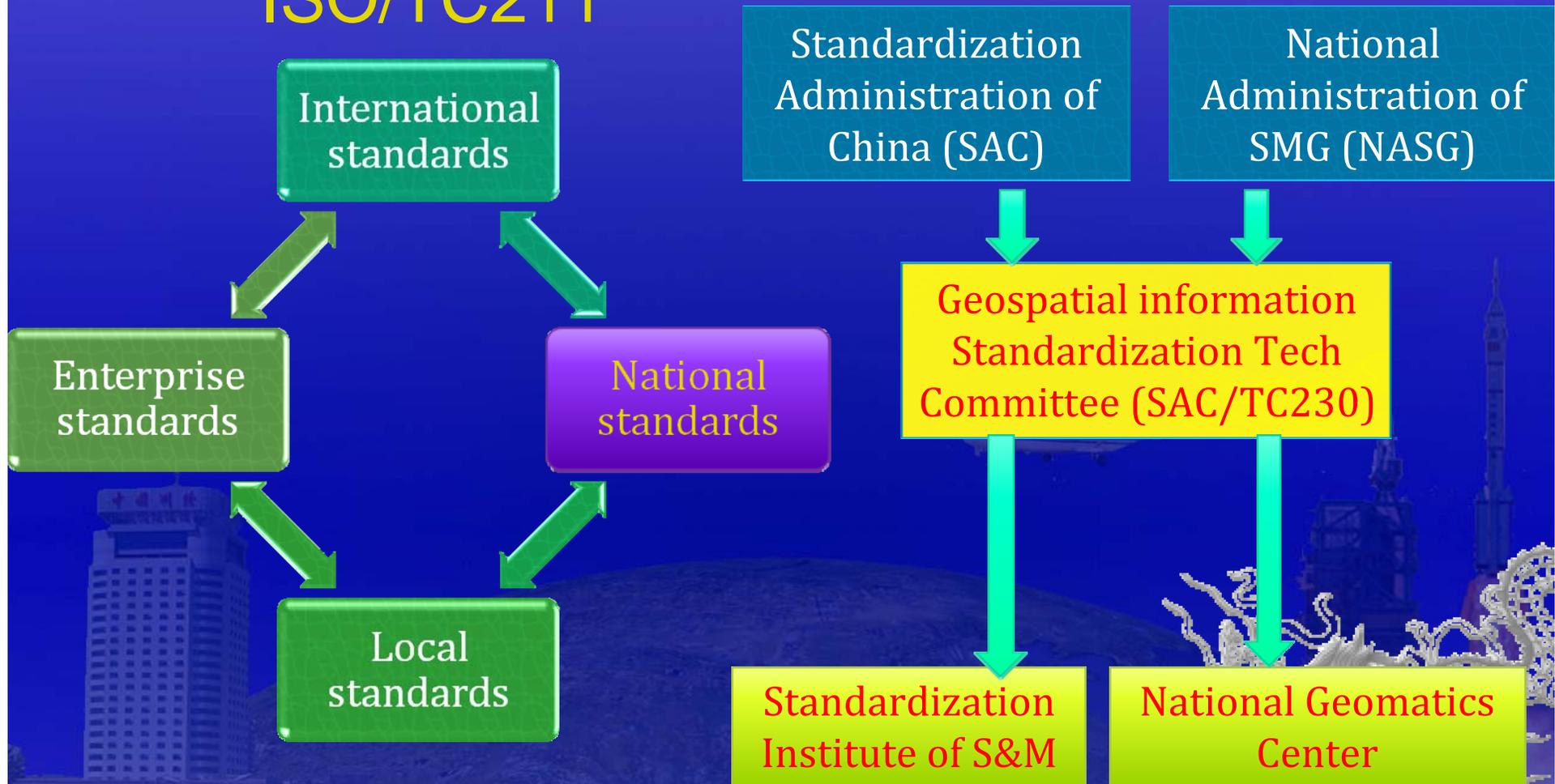
Quality  
Supervision

- National
- Provincial
- Municipal



# Standards Administration

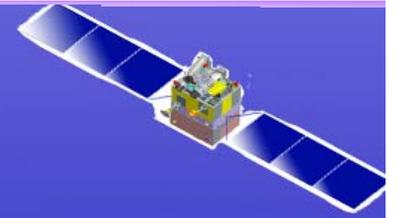
## ISO/TC211





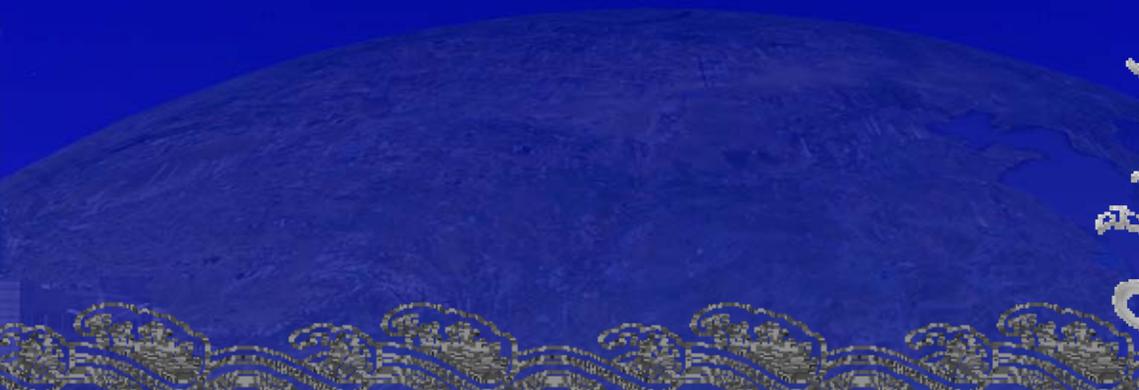
## Education and Training

- Universities > 200
- Professional Training Institutes > 20
- Technical Schools > 10
- Engineering of Surveying and Mapping
  - Geodesy
  - Engineering Survey
  - Cadastral Survey
  - Photogrammetry
  - Cartography
- Geographical Information System
- Remote Sensing
- Geographical Information Monitoring



3

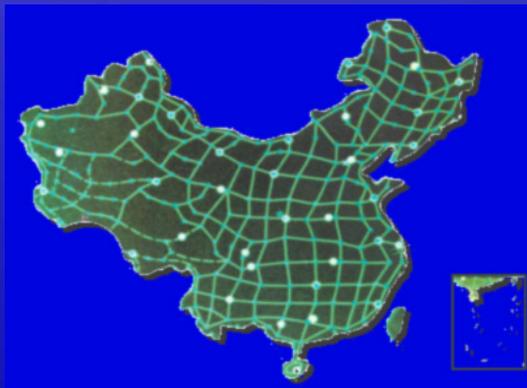
# Geo-Reference Framework and Geo-Data Resources





# Geodetic Reference System

National Horizontal Control Network



National Vertical Control Network



Beijing 1954



Xian 1980

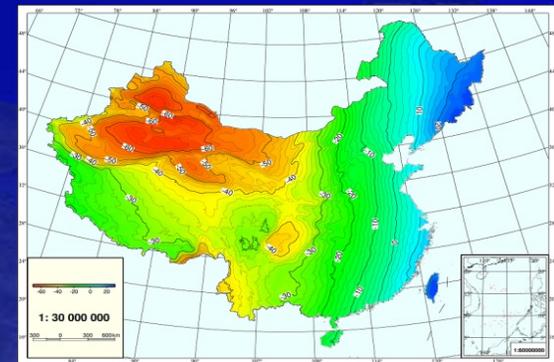


China Geodetic  
Coordinate System  
CGCS 2000

National GPS Network



National Gravity Network



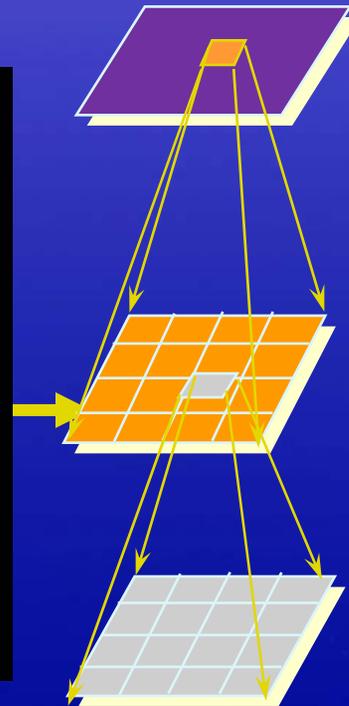
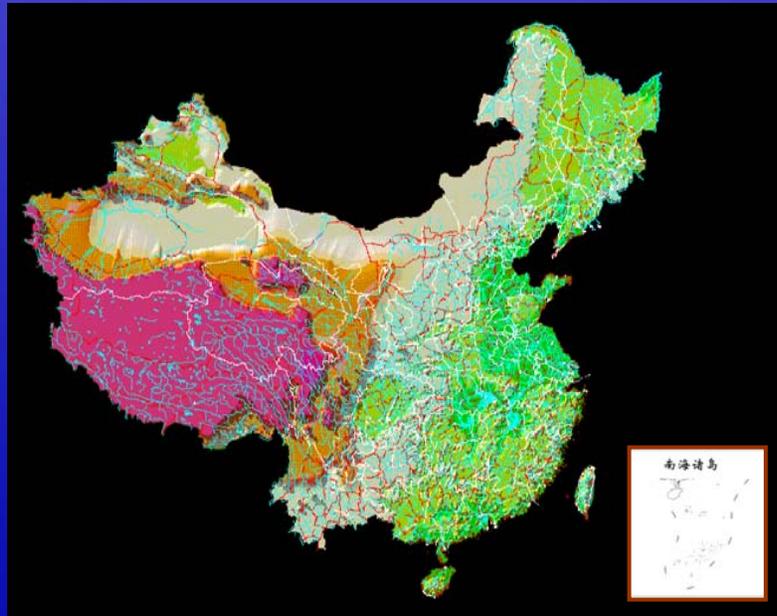
# Modern Geodetic Datum



GNSS continuously operating reference stations



# Base Map Series and Coverage



1:1 million

1:250,000

1:100,000

1:50,000

1:10,000

1:5,000

1:2000

1:1000

1:500

Nation

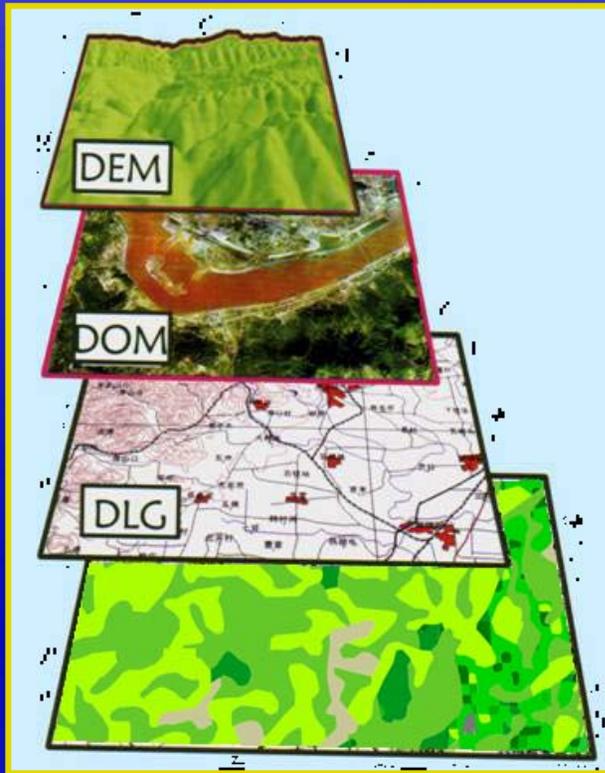
Province

City

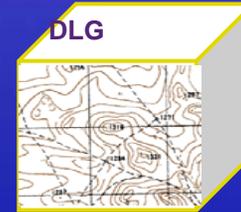
Topographic maps and databases at 1:1 million, 1:250,000 and 1:100,000 covering 100% land area; 1:50,000 90%; 1:10,000 50%; 1:2000 most cities



# Main fundamental data products



30m  
5-10m  
1 - 2.5m  
0.2-0.5m



1km\*1km  
100m\*100m  
25m\* 25m  
5m\*5m

**National Fundamental Geo-Database**



# Records Index and Service

National Node

Provincial Node

Municipal Node

国家测绘地理信息局

首页 | 政策法规 | 行政许可 | 规划计划 | 测绘监管 | 基础测绘 | 测绘成果 | 人事人才 | 政务公开 | 交流合作 | 党建工作

国家测绘地理信息局—测绘成果发布服务

### 全国测绘成果分发服务

QUAN GUO CE TUO CHENG GUO JIAO PEI FA FU WU

查询 高级查询 地图查询 玉树地震测绘成果目录

国家基础地理信息中心(193126) >>	山东省(149333) >>	湖北省(101647) >>	浙江省(97760) >>
福建省(80252) >>	四川省(78543) >>	江苏省(60518) >>	湖南省(56565) >>
吉林省(33707) >>	黑龙江(27877) >>	河南省(56565) >>	重庆市(24551) >>
陕西省(24431) >>	云南(22945) >>	广西壮族自治区(27227) >>	河北省(21328) >>
广东省(21233) >>	山西(18712) >>	内蒙古自治区(22274) >>	河南省(16110) >>
天津市(15913) >>	贵州(14258) >>	甘肃省(16893) >>	辽宁省(11765) >>
安徽省(9378) >>	北京(11830) >>	宁夏(2701) >>	上海市(325) >>
新疆维吾尔自治区(2466) >>	海南(6833) >>	江西省(5618) >>	
负责单位所在行政区(30) >>	青海(2048) >>	西藏自治区(470) >>	

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主管：国家测绘地理信息局  
运行维护：国家基础地理信息中心  
北京海淀区莲花池西路28号 邮编：100830  
京ICP备05071668号

国家测绘地理信息局—测绘成果发布服务

### 全国测绘成果分发服务

QUAN GUO CE TUO CHENG GUO JIAO PEI FA FU WU

1:1000000 切换地图 矢量地图

1、使用放大、平移等工具定位地图到需查询资料的区域。

2、在工具栏中选择工具通过拖拽查询、多边形查询、圈线查询、点选查询等工具在地图上定义你要查询的区域范围，系统将查询该区域内的元数据记录。

3、查询结果以列表方式显示与地图右侧的信息栏中，你可以对元数据记录进行定位、分组过滤、排序、加入订购等操作。

4、点击按钮在分割条可以隐藏地图窗口放大显示查询结果列表方便操作。要再次显示地图窗口可点击按钮。

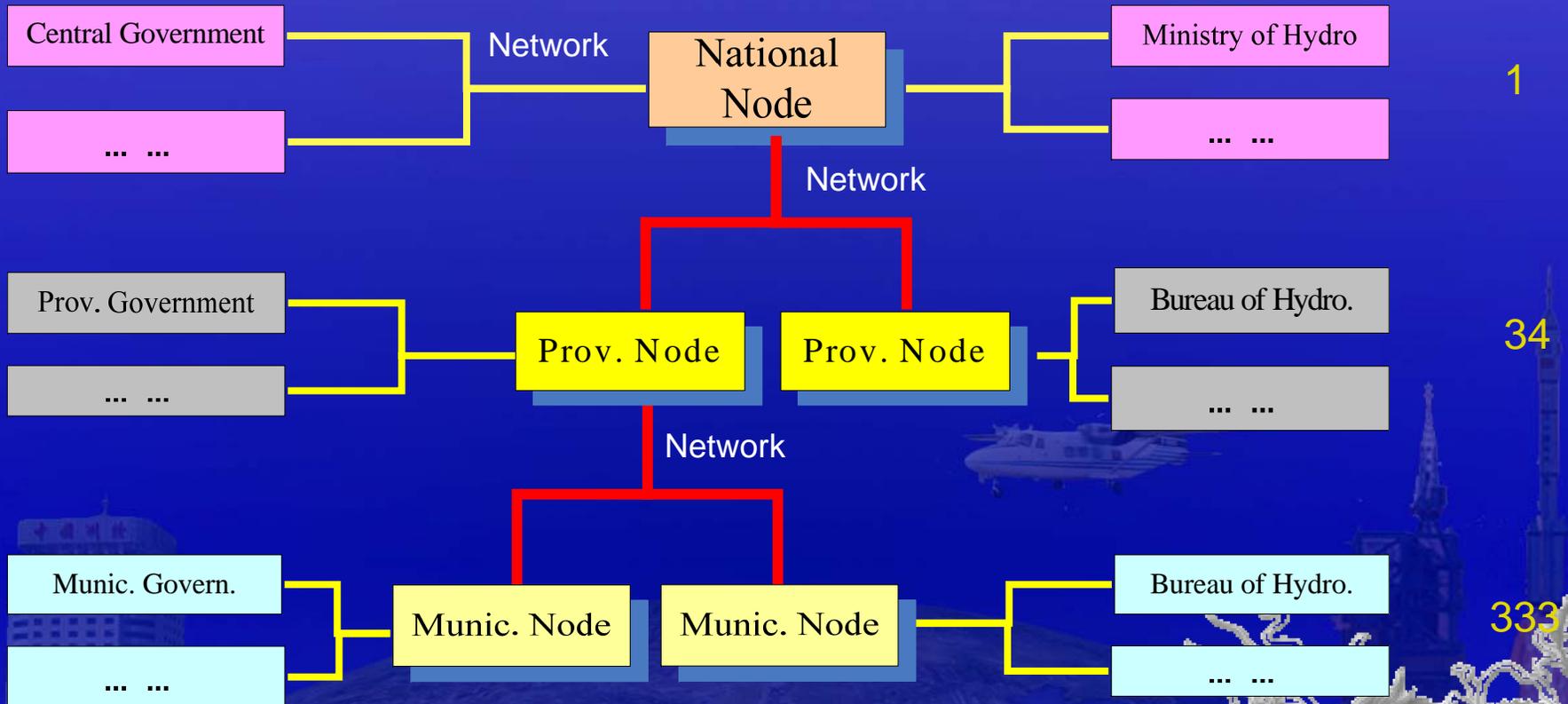
5、查询结果列表顶端显示当前查询结果中包含的分组过滤的分类信息和统计数据，点击分类可以按该分类进行过滤查询。点击联合查询将逐级分组过滤查询只使用当前分组过滤。

6、点击查看订购按钮可以查看订购产品信息，根据中心的流程进行订购。

主管：国家测绘地理信息局  
运行维护：国家基础地理信息中心  
北京海淀区莲花池西路28号 邮编：100830  
京ICP备05071668号



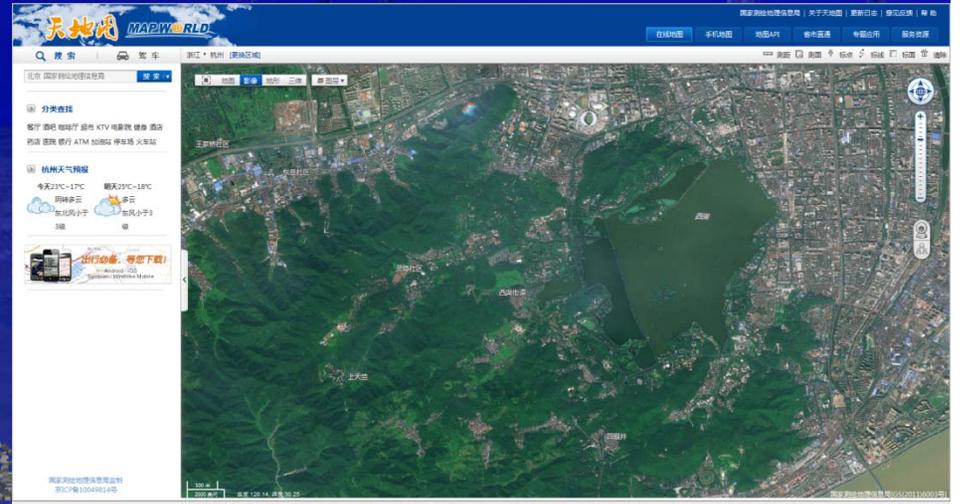
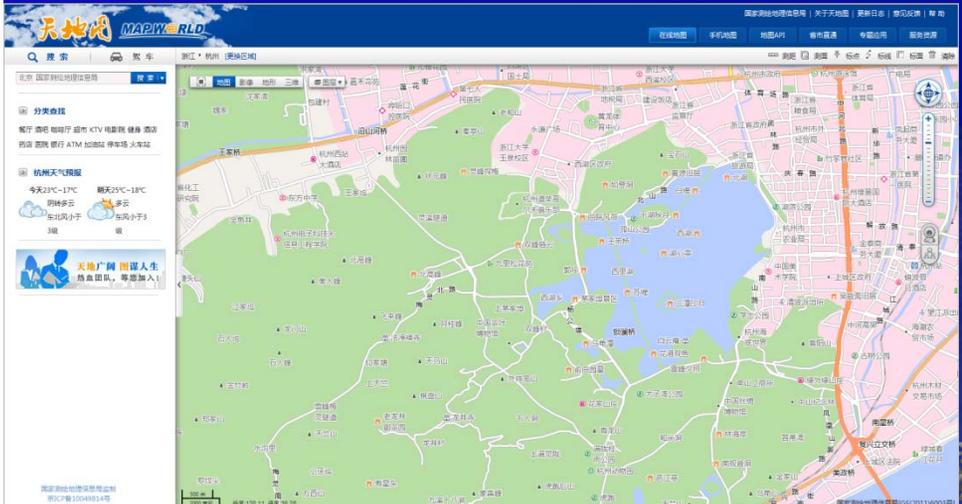
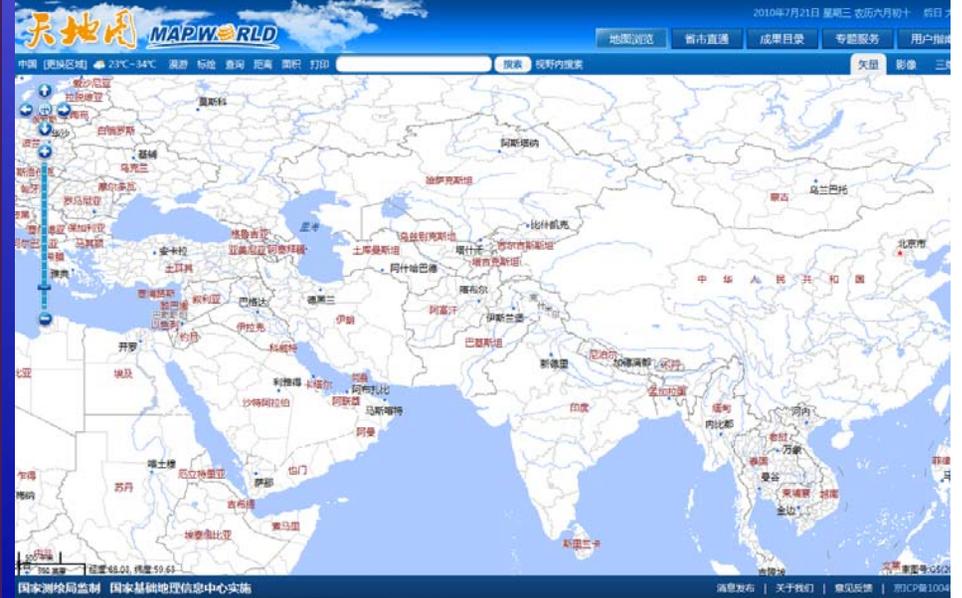
# General Structure of the Platform



- ⊙ Government Network: for e-government users
- ⊙ Public Network(Internet): for public



# Map World





# Image Browser



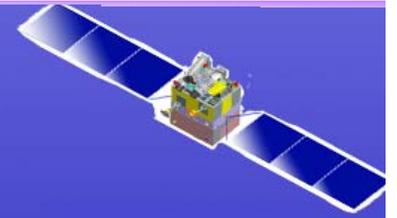


# 3D browse



# Searching, Labeling and Routing

Four large, empty purple rectangular boxes arranged in a 2x2 grid, separated by a dark blue cross-shaped border. The background of the slide is a dark blue image of a city at night, visible through the central cross and the bottom edge.



4

# Development of Science and Technology





# Compass (Beidou) Satellites



Geostationary Orbit (*GEO*) 5

Middle Earth Orbit (*MEO*) 27

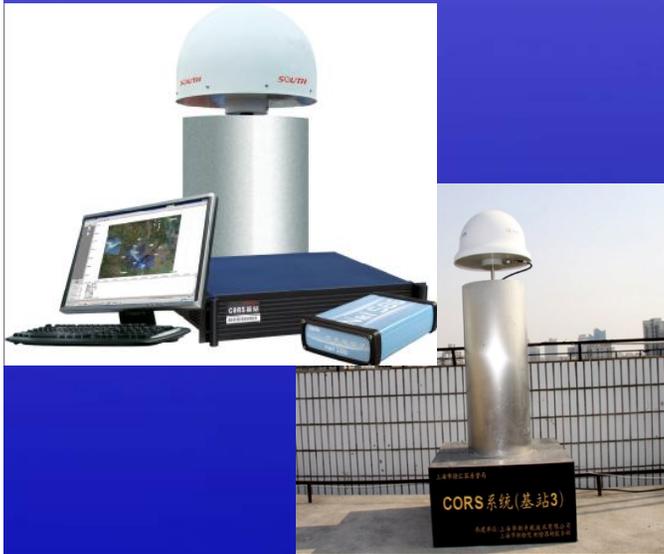
Inclined Geostationary Orbit (*IGSO*) 3

2012 Asia Pacific

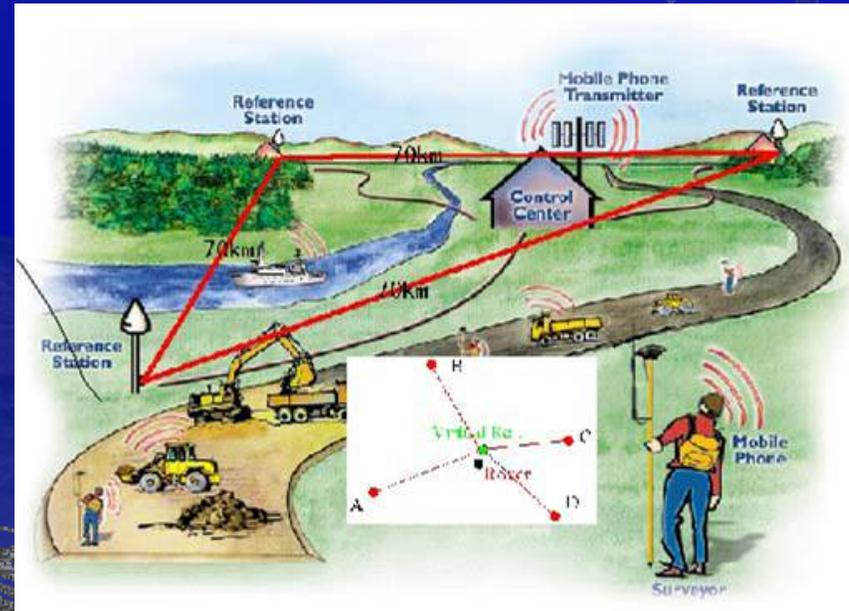
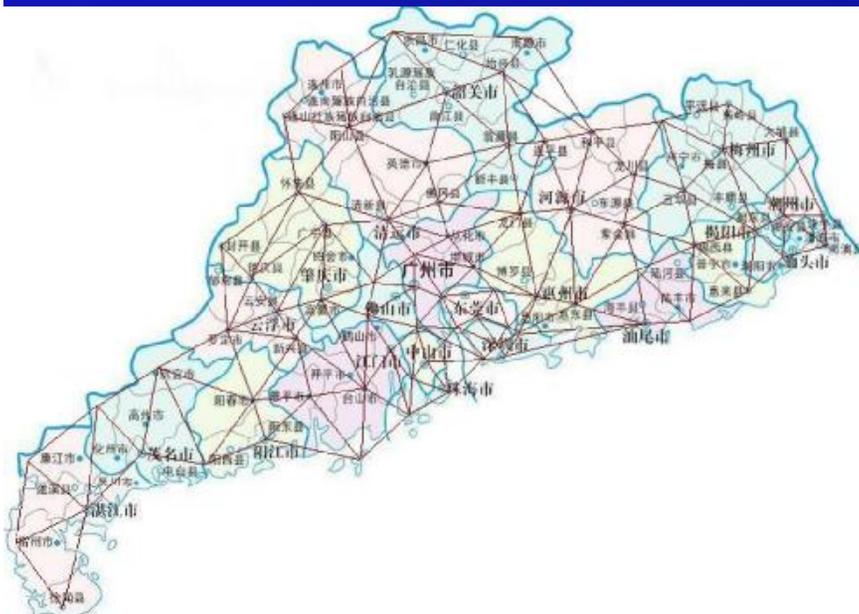
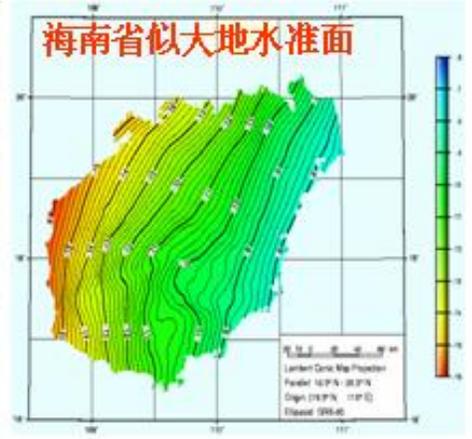
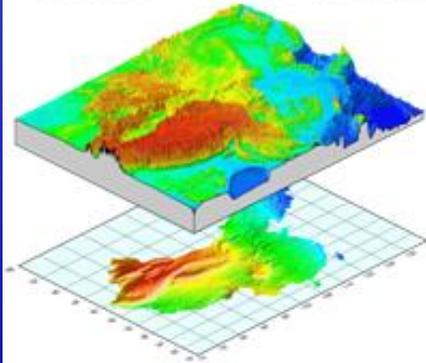
2020 Worldwide



# Geoid and Regional CORS Network

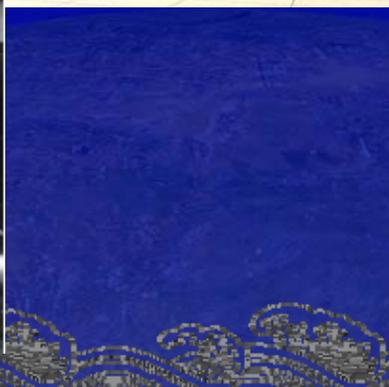


中国地形和CGQ2000似大地水准面



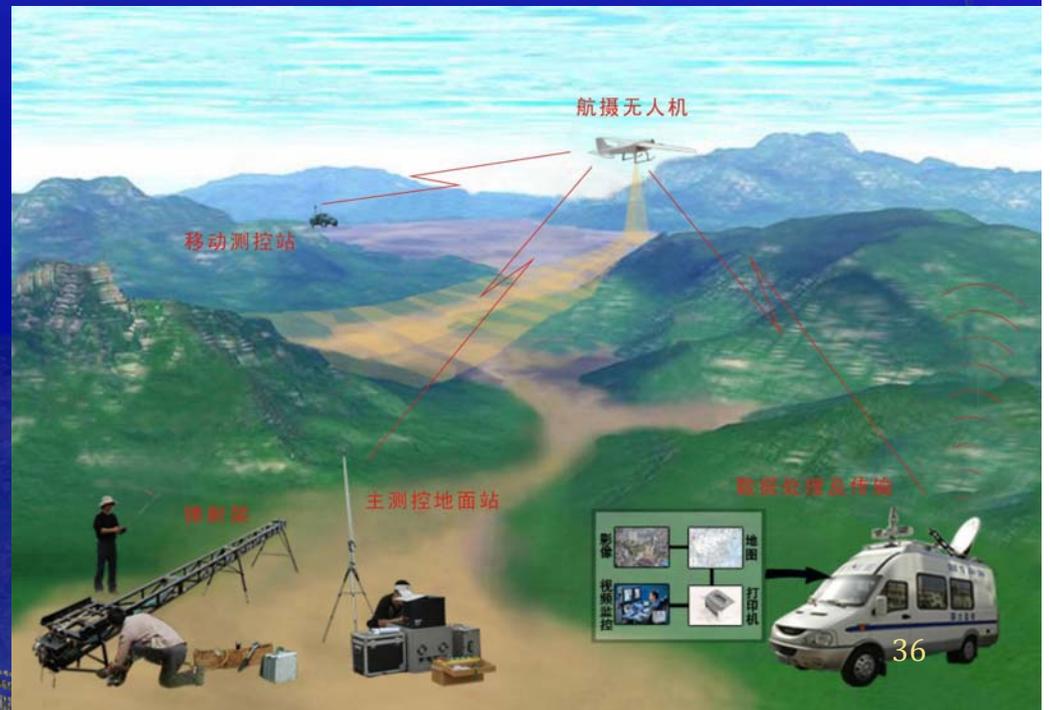
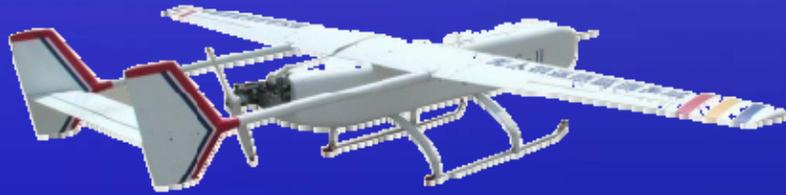


# Mobile Mapping Systems





# UAV Photography System

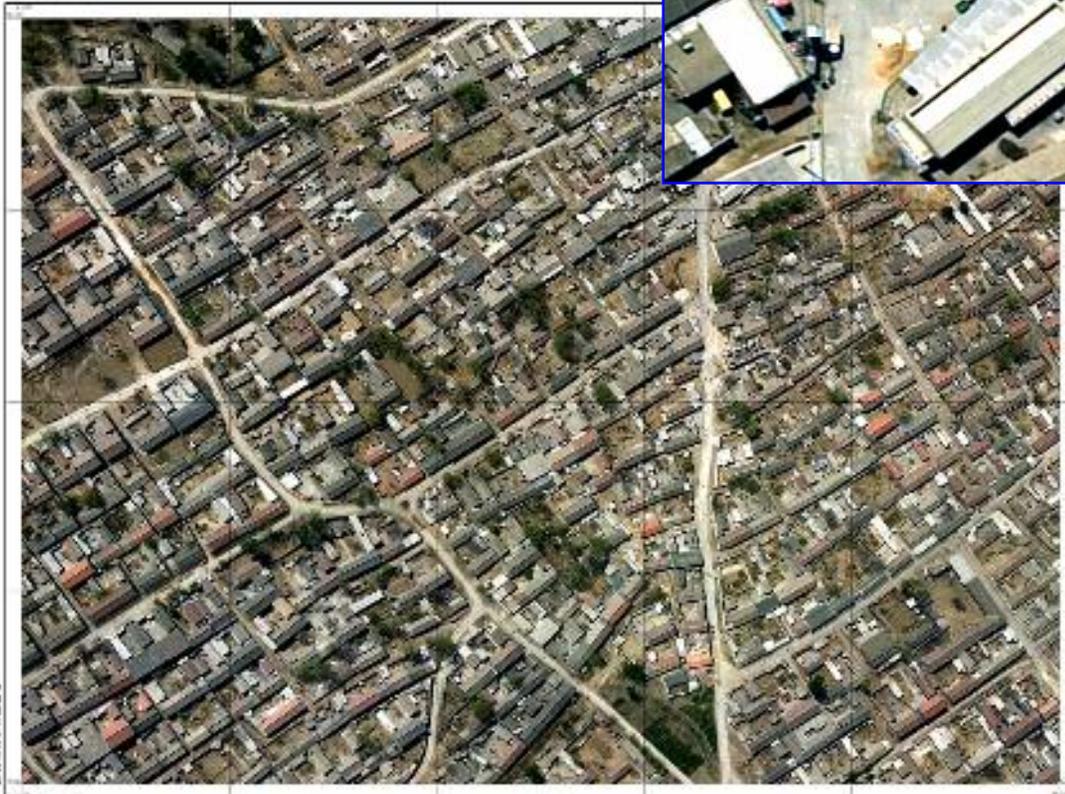
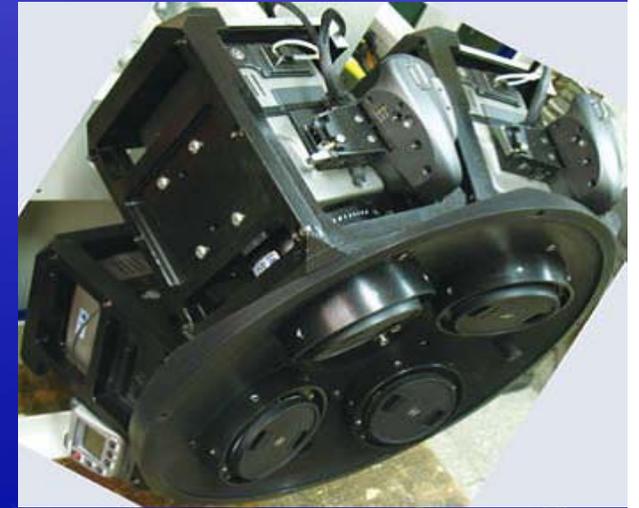




# Digital Aerial Camera



123-11(3)



数字航空摄影测量

1:500

1:500





# Airborne InSAR Mapping System



SAR



POS



Integrated System



X band antenna

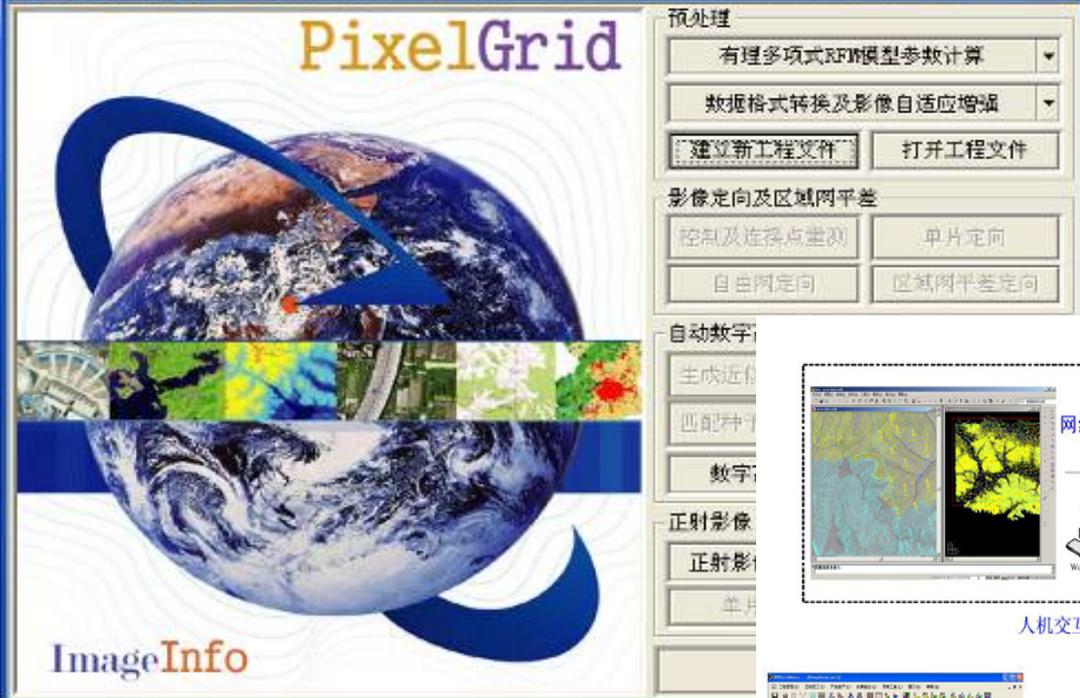


P band antenna



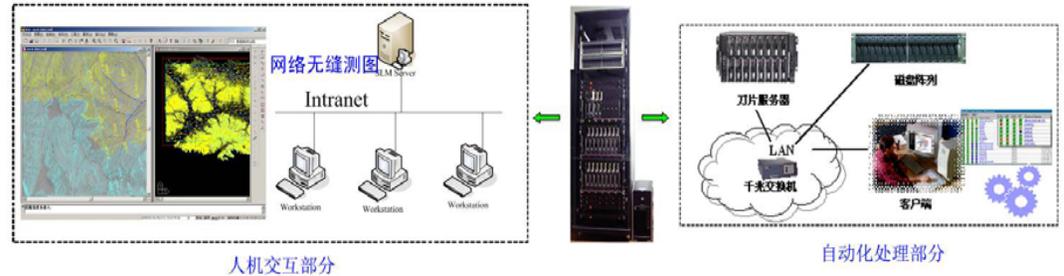
# DPS and Remote Sensing Software

高分辨率遥感影像一体化测图系统 (ImageInfo-PixelGrid V2.0版, 2007年10月).....

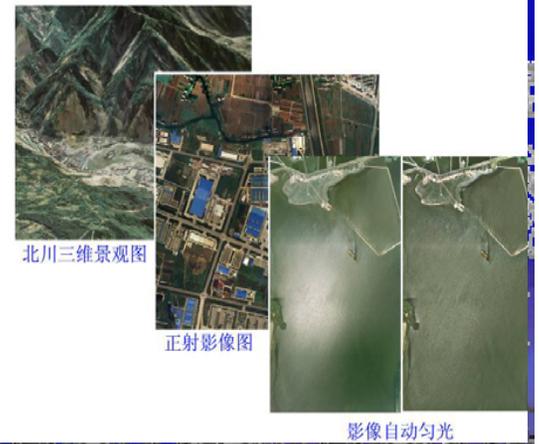
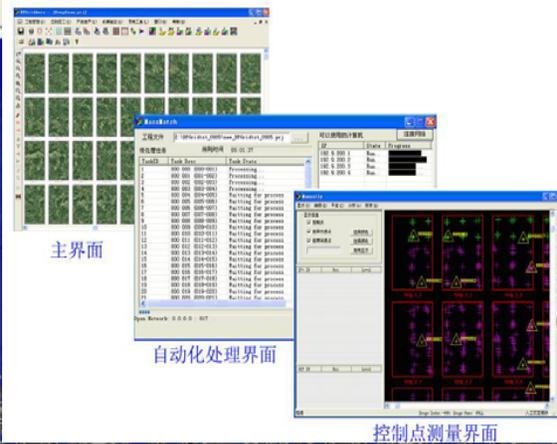


## PixelGrid

DPGrid体系架构



## DPGrid





# ZY3 Mapping Satellites

Tri-linear Pan cameras  
Forward Backward 3.5M  
Nadir 2.1M  
Strip width 50KM

Multi-spectrum  
4 bands 5.8M  
Strip width 50KM

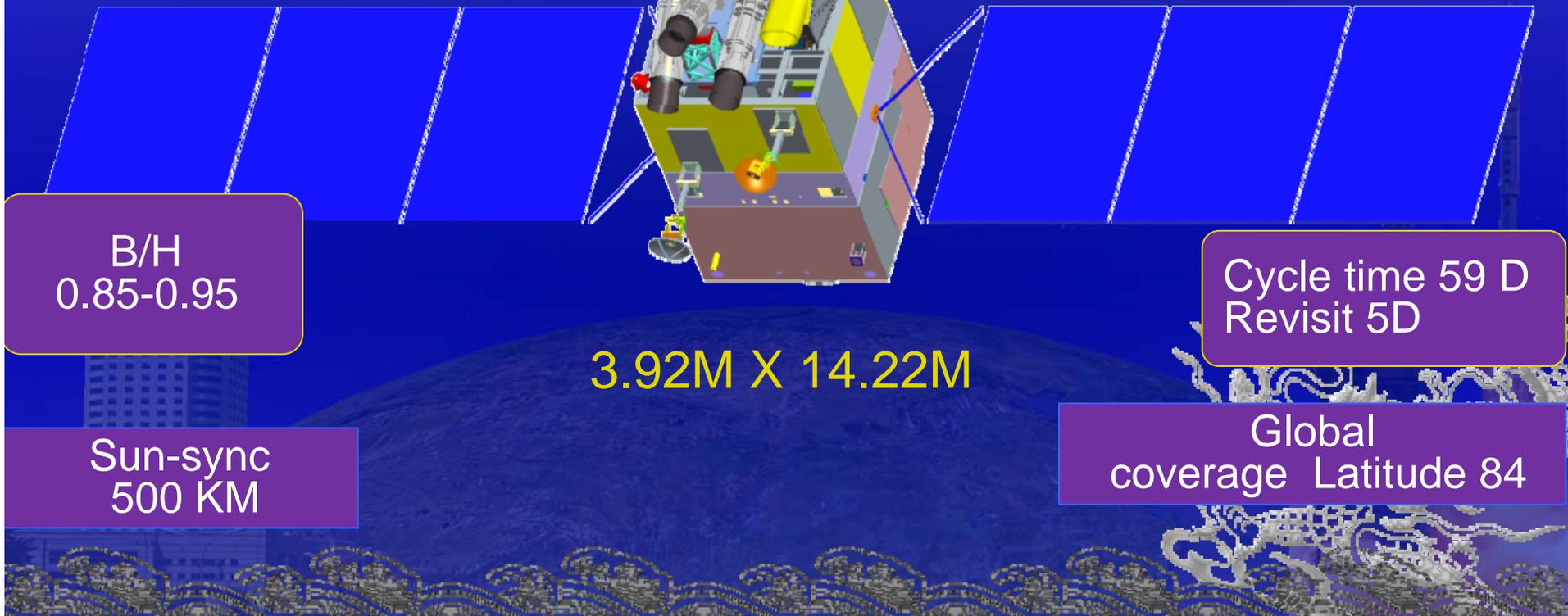
B/H  
0.85-0.95

Cycle time 59 D  
Revisit 5D

3.92M X 14.22M

Sun-sync  
500 KM

Global  
coverage Latitude 84





# ZY3 Image Global Coverage

★成果类型 全国

- 基本测绘遥感影像
  - 正视全色影像 2.5m
  - 前视影像 4m
  - 后视影像 4m
  - 多光谱影像 6m
- 高级测绘遥感影像
  - 精纠正产品
  - 正射纠正产品
  - 数字正射影像产品
- 数字地形产品
  - 数字表面模型
  - 数字高程模型
  - 数字线划图
  - 数字栅格图
- 影像控制点库
  - 1米影像控制点
  - 2.5米影像控制点
  - 15/30米影像控制点

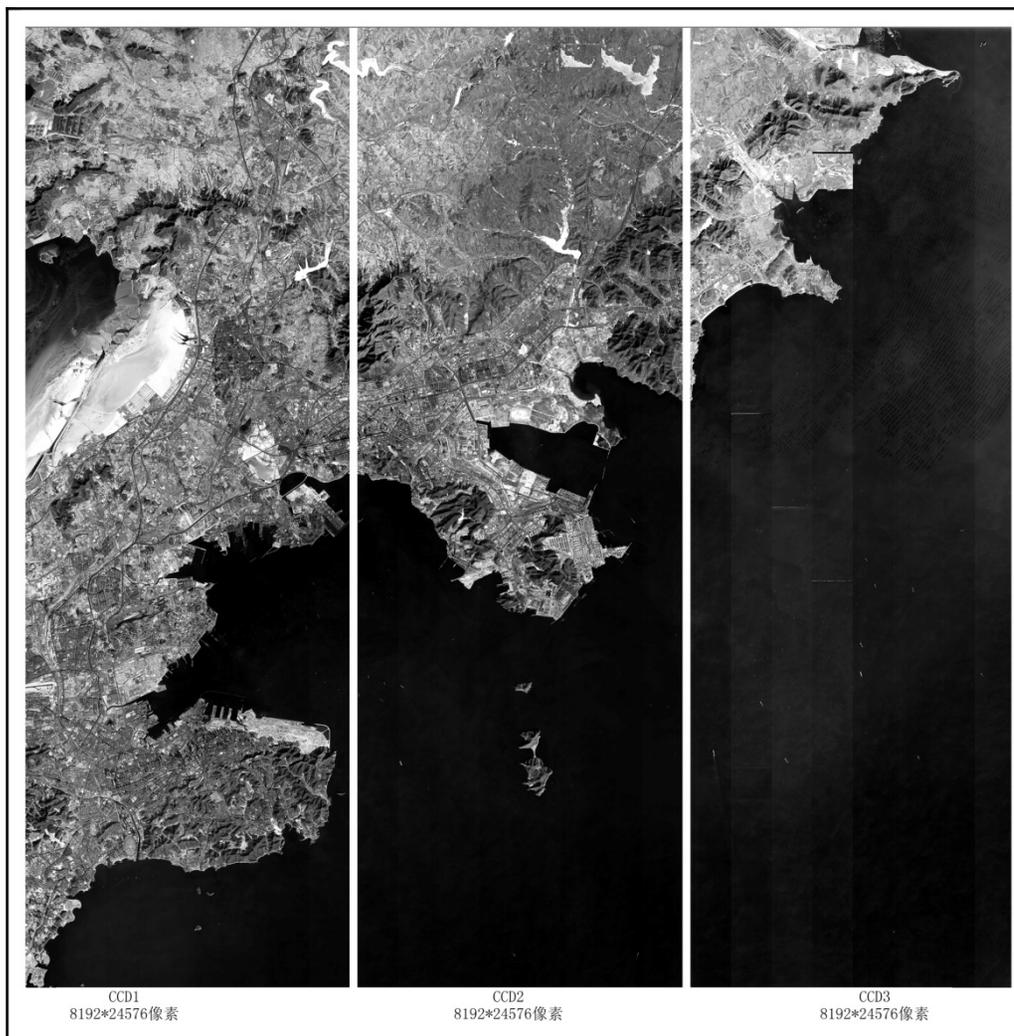
经度:209.91, 纬度:-27.87

云里: <=40%



# ZY3 Image Gallery :Raw Data

资源三号测绘卫星正视相机原始影像（全色）



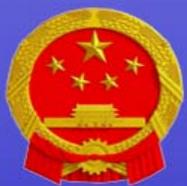
后视 Backward

成像时间：2012年1月11日  
分辨率：2.1米 范围：50X50公里

Dalian, China

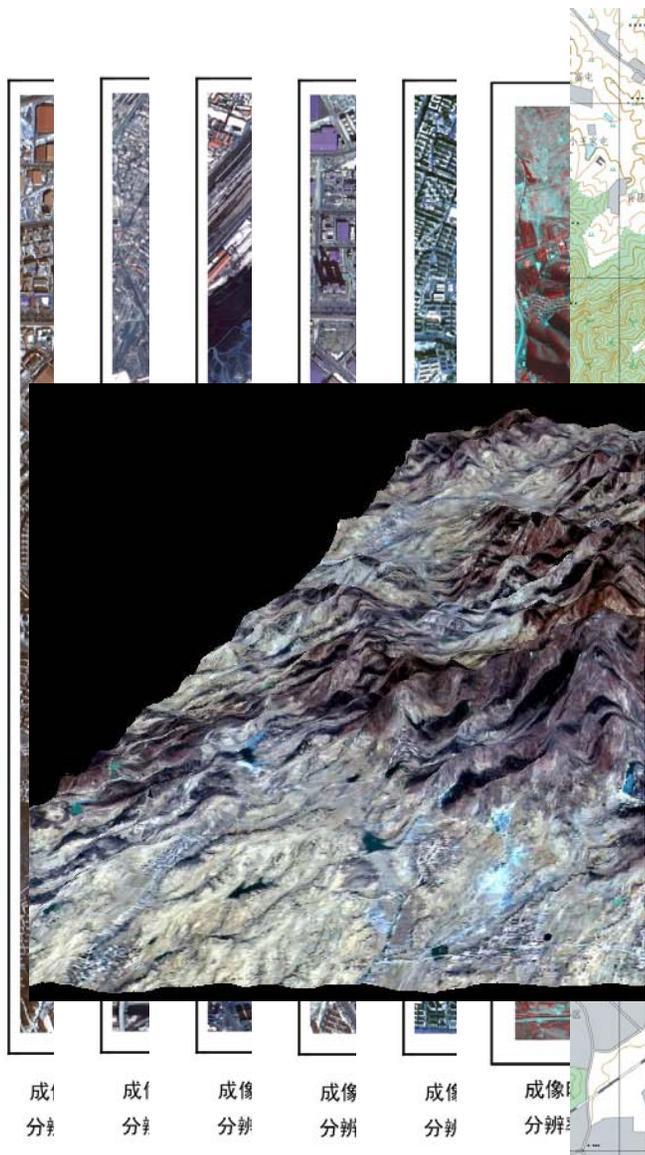
大连地区 国家测绘地理信息局卫星测绘应用中心

ards



# ZY3 Image Gallery :Data Products

资源三号测绘卫星融合影像（真彩色）

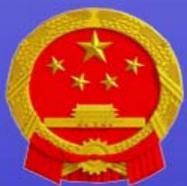


成像时间  
分辨率



成像时间：2012年2月23日  
分辨率：2.1米

北京地区金家村桥区域 国家测绘地理信息局



# ZY3 Image Gallery :Data Products

资

资源三号测绘

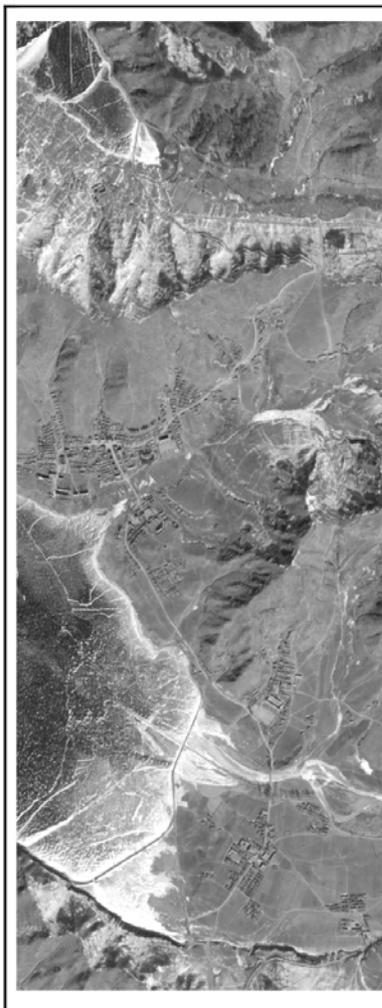
资源三号测绘卫星数字表面模型



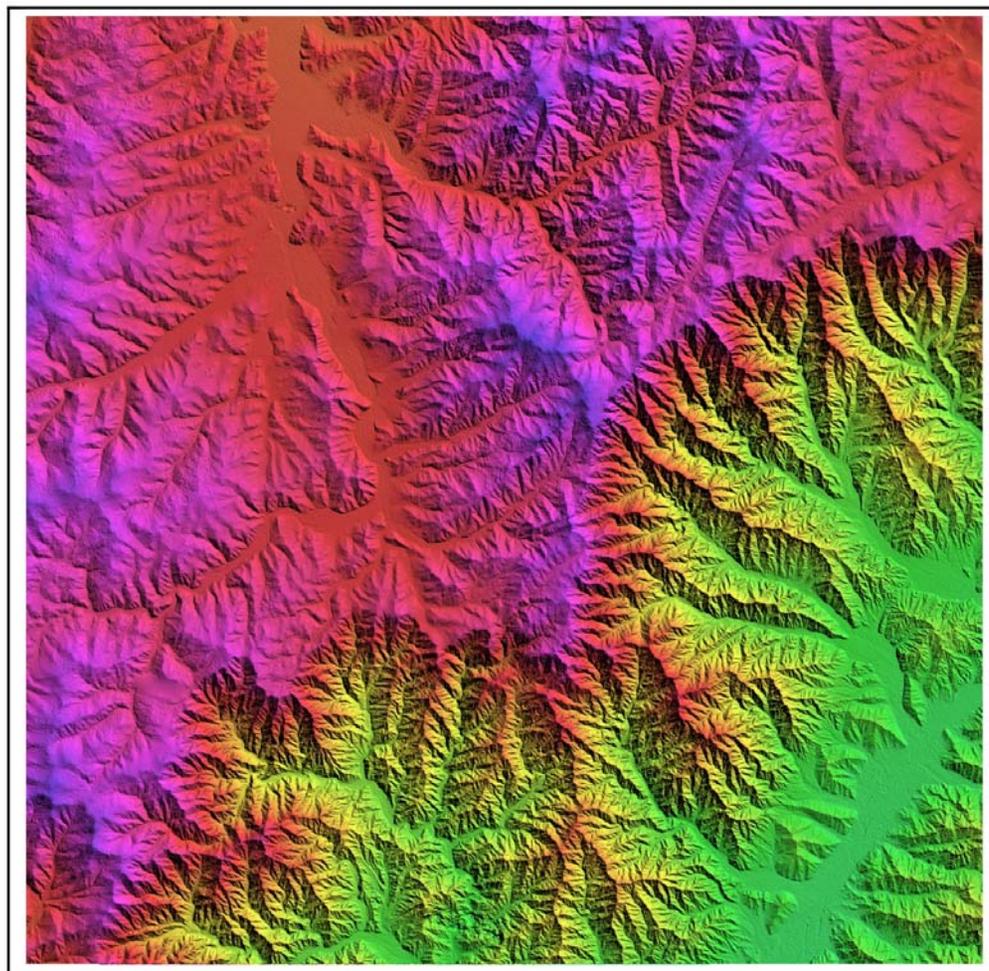
成像时间：20  
分辨率：2.1米



成像时间：20  
分辨率：2.1米



成像时间：2012年1月18日  
分辨率：2.1米

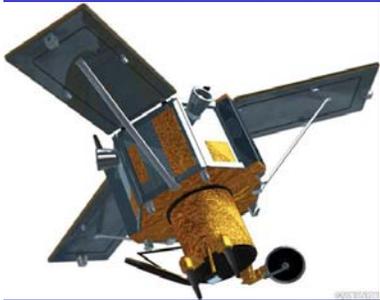


成像时间：2012年1月11日  
格网尺寸：20米

朝鲜 咸镜南道

国家测绘地理信息局

# Mapping Satellites Planned



2-5m Pan、 6-10m multi-spectrum

1-2m Pan、 3-6m multi-spectrum

0.5-1m Pan、 1-3m multi-spectrum

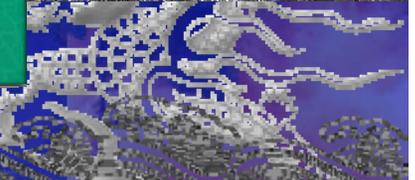
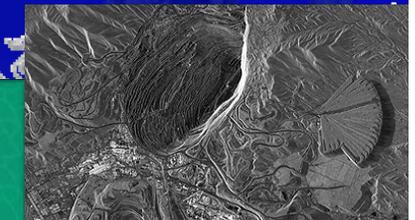


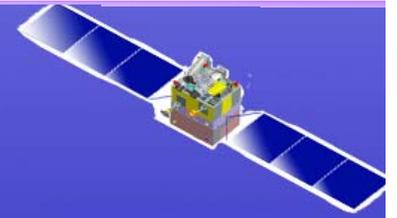
3-5m 、 C band/S band SAR

0.5-1m、 multi-band SAR



2 Bands Laser Ranging, 1 m Pan





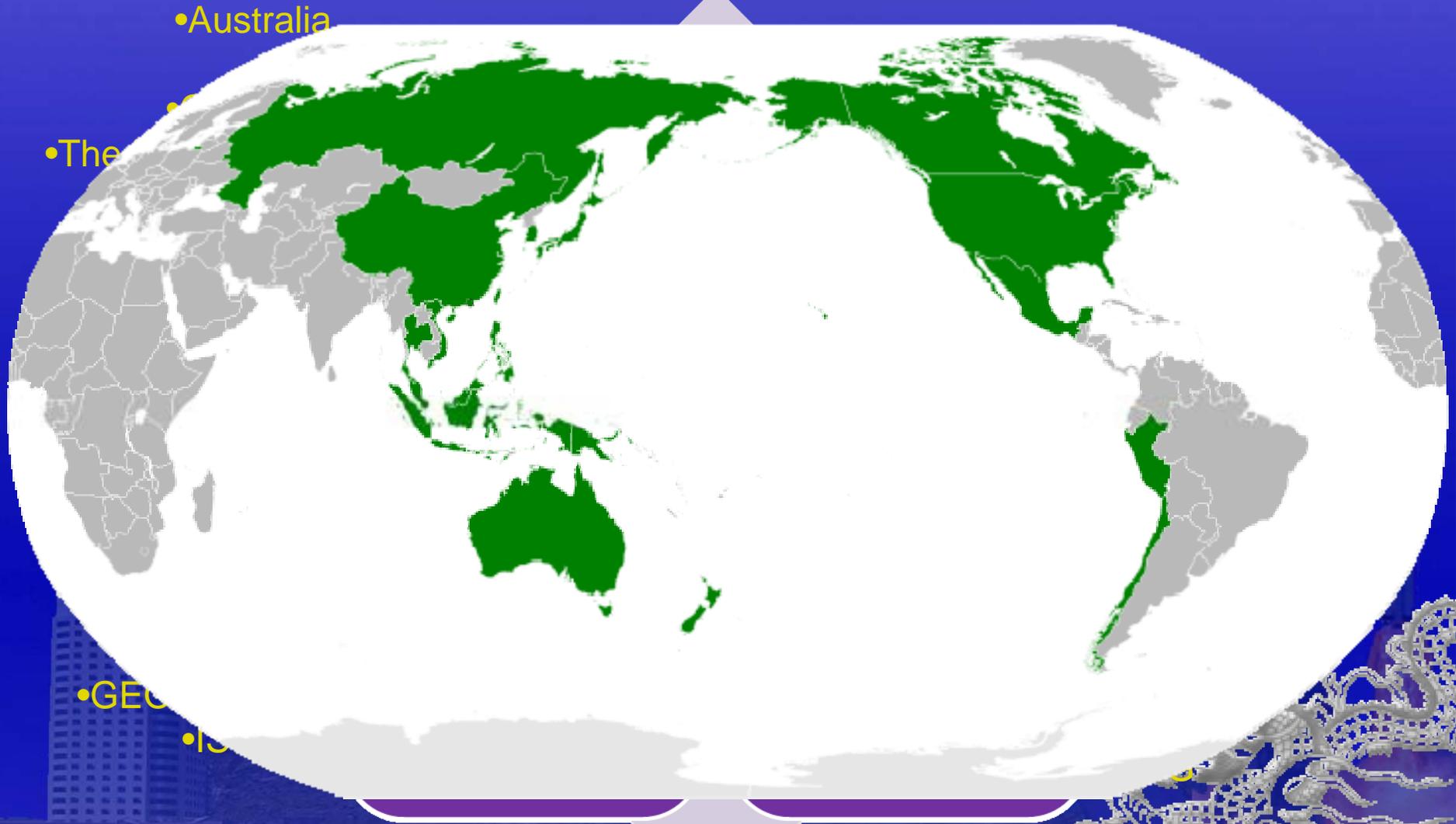
5

# New Mechanism for International Cooperation





# International Cooperation





# UN-China Technical Cooperation Trust Fund

**Geospatial Information Management Capacity Development  
in China and other Developing Countries (GIMCD)**  
(US\$800,000 per year for 5 years)





# 2nd China Forum on UN-GGIM and UN-GGIM-AP Executive Board Meeting

The screenshot shows a web browser window with the URL <http://www.tianditu.cn/map/index.html>. The browser's address bar and search engines (Home Page, DATA Home Data, 新华网, MSN, UNRCC, 卫星中心, 天地图, CNN, 搜狐, 人民网, 凤凰网, Google, 国测局, 百度) are visible. The main content is a topographic map of China with several colored markers: a blue circle in the north (Inner Mongolia), a purple circle in the southwest (Sichuan), and a green circle in the east (Zhejiang). A purple callout bubble with the text "April 24 to 26, 2013" points to the purple marker. Three inset images are present: a top-left image of a yellow and green checkered field, a bottom-left image of a panda with its cub, and a bottom-right image of a panda. The browser's taskbar at the bottom shows icons for Microsoft PowerPoint, MT870, and system tray icons including a clock showing 23:23.

April 24 to 26, 2013



# UN-GGIM-Training Center-China(UN-GTC)

- Leadership enhancing at Director level
- Senior Engineer Training and Field works
- Diploma and degree courses





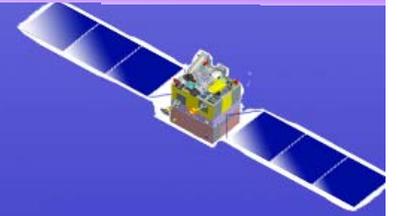
# Willing to share globally

1. Compass Navigation System
2. Chinese Mapping Satellites
3. WebMap service Platform: MapWorld
4. Digital City/Smart City Solutions
5. UAV Remote Sensing Platforms
6. Education and Training
7. Global Geographic Monitoring
8. R&D



# Conclusion Remarks

1. Government Needs and Emergency Mapping
2. Geodata Resource
3. Technical Supports
4. International Cooperation
5. Private Business Development
6. Educational and HR development
7. Standards and quality assurance
8. Legal system and supervision mechanism



Welcome to China for  
UN-GGIM Forum to be held from  
April 24 to 26

GGIM benefits the world!

Thank you!

