

**Historical GIS in Digital Archive and Research:
The Historical GIS of CCTS and THCTS in Academia Sinica**

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Background

- Everything Happens in the Framework of Time and Space

Temporal and Spatial attributes of People, Events, and Objects

Aims

- Catch and Manage the Temporal and Spatial Attributes
- Create Visual Effects
- Construct a System Environment Amenable to Human Cognitive Model

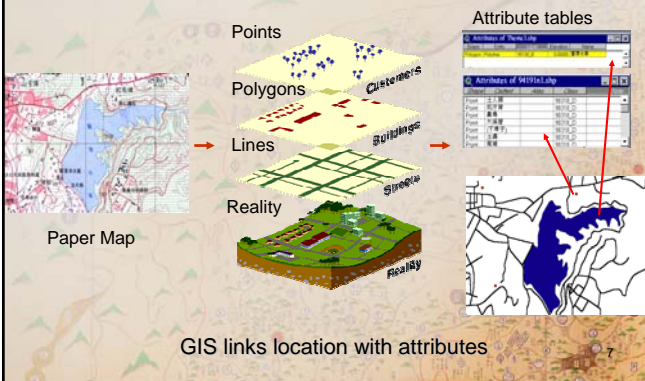
What is GIS ? 1/3

- Geographic Information System/ Geographic Information Science**
- GIS can process, integrate and analyze spatial data
- GIS can help to solve real-world problem in support of decision-making

What is GIS ? 2/3

- GIS in the past
 - Paper maps, typewriter, books, drawing tools...
- Modern GIS
 - Personal computer, workstation, software, database, network...

What is GIS ? 3/3



Creating Two Historical GIS

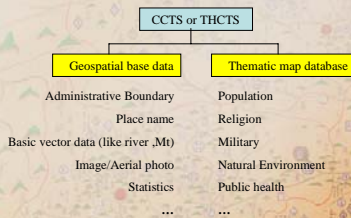
Two Virtual Spatio-Temporal Platforms:

- Chinese Civilization in Time and Space - CCTS
- Taiwan History and Culture in Time and Space - THCTS

Platform Structure

The Platform Consists of Three Components :

- Spatial Database (Maps, Aerial Photos, Satellite Images)
- Web Based GIS Functions
- Thematic Maps



Chinese Civilization in Time and Space, CCTS

- Overlay 《 *The Historical Atlas of China* 》 with 《 Arc/China 》 (1 : 1,000,000) to construct a spatio-temporal framework of more than 2500 years

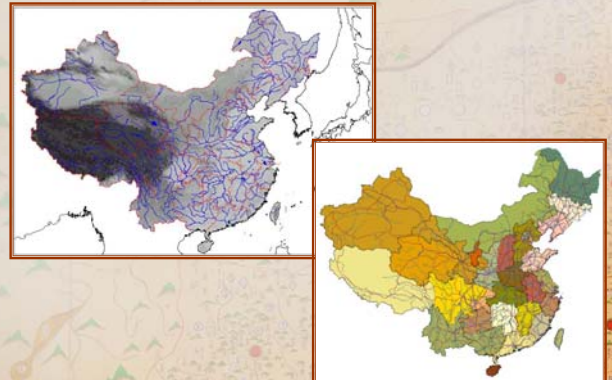


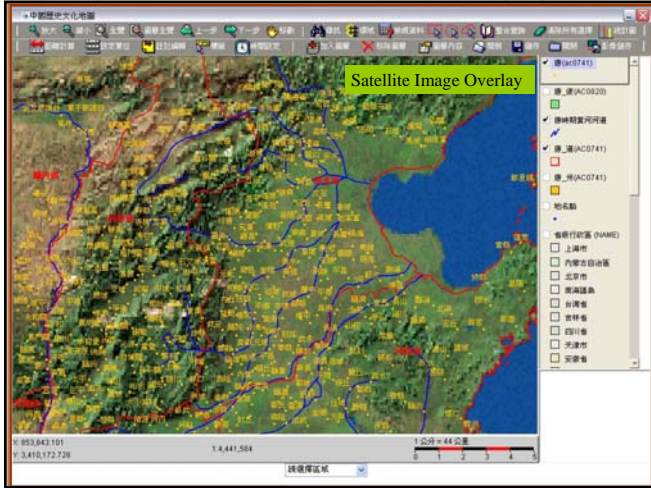
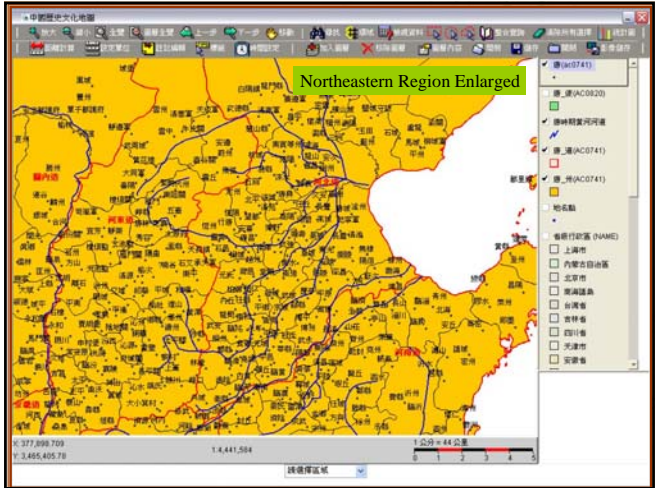
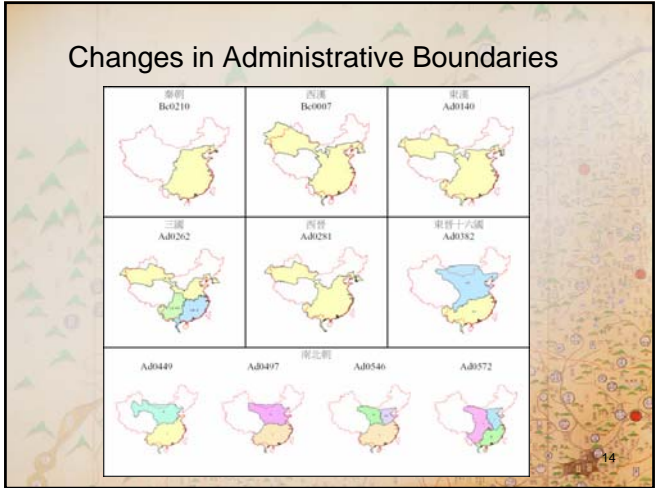
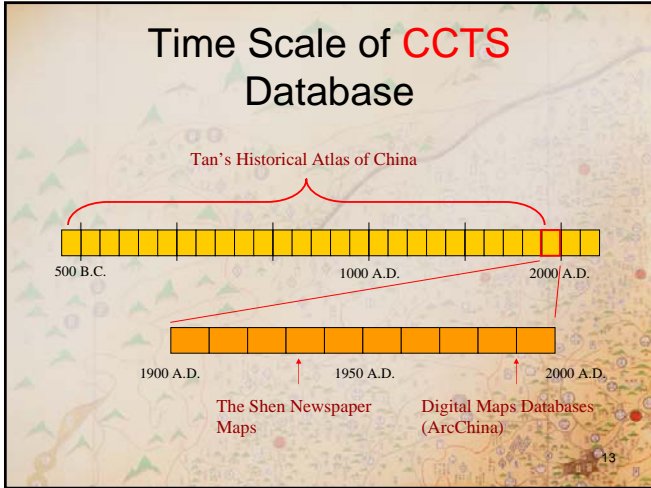
The Dataset of CCTS: The Historical Atlas of China (Various Scales from 1:2,100,000 to 1:7,180,000)

- 8 Volumes with 20 Groups, 304 Pieces of Historical Maps from pre-Qin Era to the Qing Dynasty



- The Dataset of Arc/China, published by the National Bureau of Surveying and Mapping, PRC., in 1990s with 13 features and 77 map blocks,





Interface of The Chinese Civilization in Time and Space System

- A WebGIS-Based Infrastructure for Content Navigation and Web Mapping
- Integrating Geospatial and Attribute Information via the Internet
- Users can Upload Data, Create Their Own Maps and Save Them in the Client or Server Side.

Taiwan History and Culture in Time and Space, THCTS

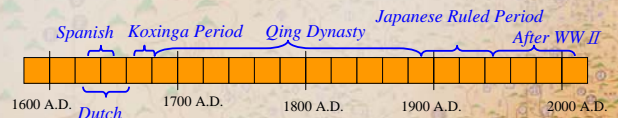
- 《Historic Bao Atlas of Taiwan》(1904), 《Topographic Atlas of Taiwan》(1920), and recent 《Topographic Maps of Taiwan》(1990's), constitute the primary data base. These base maps cover four different periods of taiwanese history: the “Dutch and Spanish Period”, the “Koxinga Period”, the “Qing Dynasty Period”, and the “Japanese Colonization and post-WW II Period”.



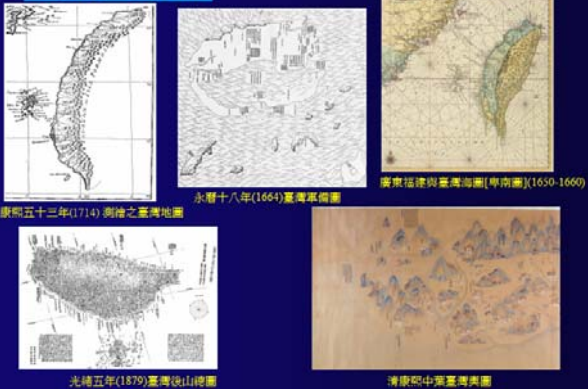
(Historic Bau Atlas of Taiwan) (Topographic Maps of Taiwan) User Interface

Time Scale of THCTS

- Dutch and Spanish Period
- Koxinga Period
- Qing Dynasty
- Japanese Colonization Period
- After WW II Period

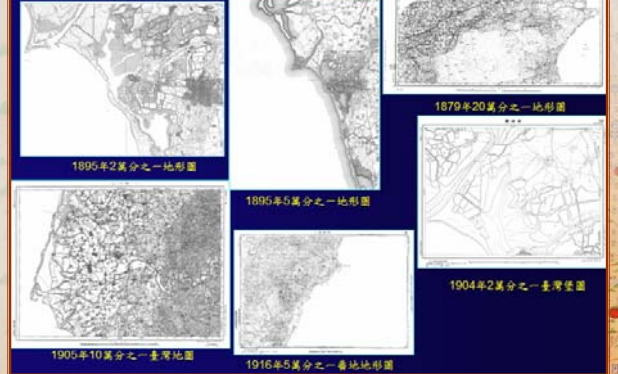


The 17th~19th Century Maps



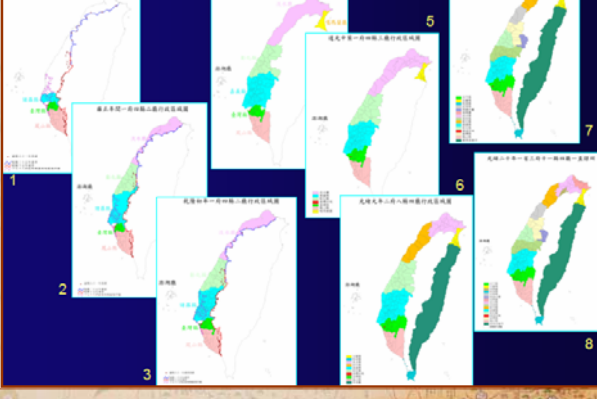
康熙五十三年(1714)劉淦之臺灣地圖
永曆十八年(1664)臺灣草圖
廣東福建與臺灣海圖(卑南圖)(1650-1660)
光緒五年(1879)臺灣後山詳圖
清康熙中葉臺灣輿圖

Topographic Maps of the Japanese Ruling Period

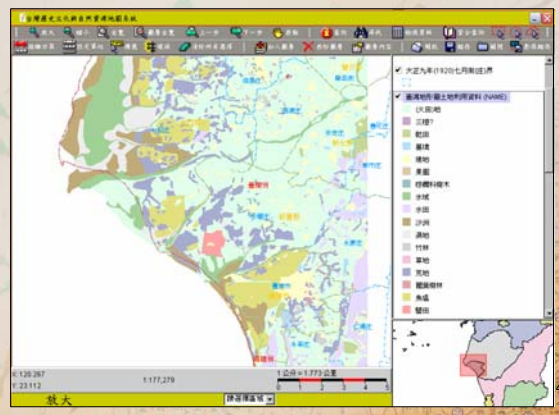


1879年20萬分之一地形圖
1895年2萬分之一地形圖
1895年5萬分之一地形圖
1904年2萬分之一臺灣全圖
1905年10萬分之一臺灣地圖
1916年5萬分之一臺北地形圖

Changes of Administrative Boundaries During the Qing Dynasty



User Interface of THCTS



Applications

- Integrate Academic Resources
- Facilitate Thematic Research
- Promote Knowledge Dissemination

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Integrate Academic Resources

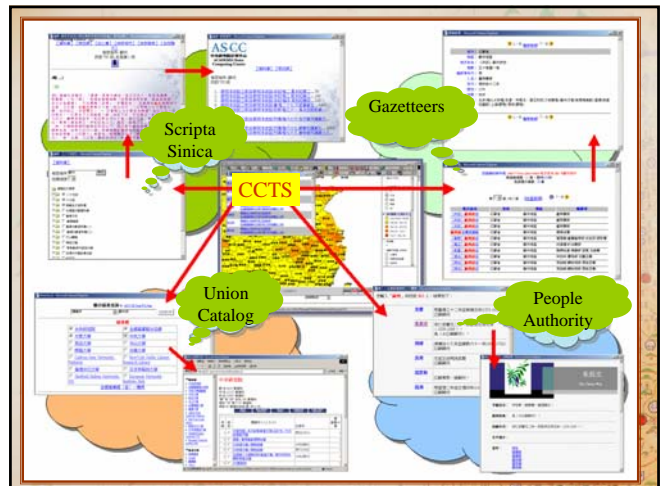
- Literature Database
- Statistical Database
- Image Database

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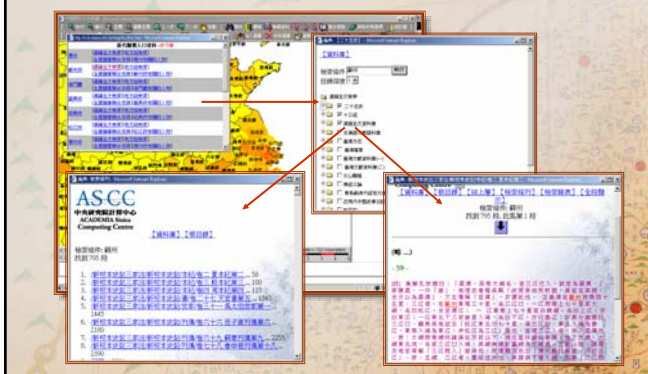
Literature Database

- Scripta Sinica (二十五史等全文檢索資料庫)
- Bibliography of Chinese Local Gazetteers (地方志目錄檢索資料庫)
- Taiwan Research Network (臺灣研究網路資源)
- Taiwan Geographic Names Information System (臺灣地名資訊系統)
- Taiwan Viceroy Administration Archive Database (臺灣總督府檔案)

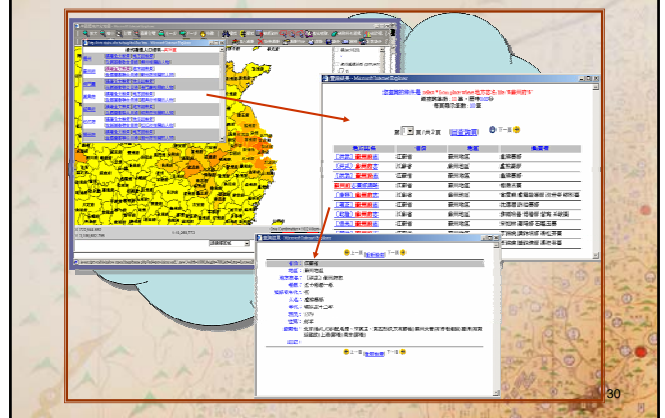
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Integrating 'Scripta Sinica' with CCTS :
Both Contemporary and Historical Place Names on the Digital Map can be Linked to Various Databases Containing Related Articles and Bibliographies.

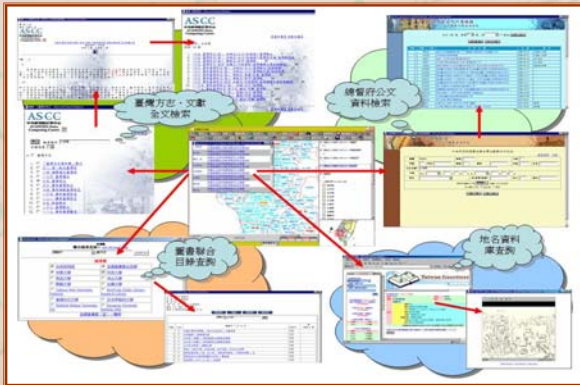


Searching the Bibliography of Chinese Local Gazetteers



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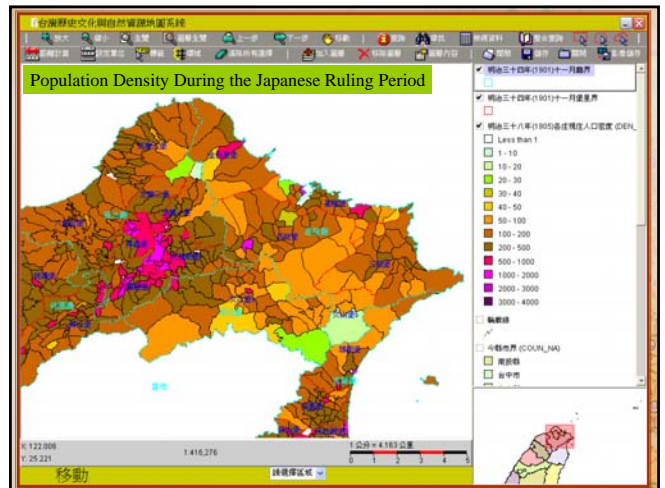
Integration with Various Databases of Taiwan with THCTS



Statistical Database

- Statistics of Grain Price and Population of the Qing Dynasty (清代糧價與人口資料庫)
- Census Data of Taiwan Population during the Japanese Colonial Period (日據時期臺灣人口普查資料)

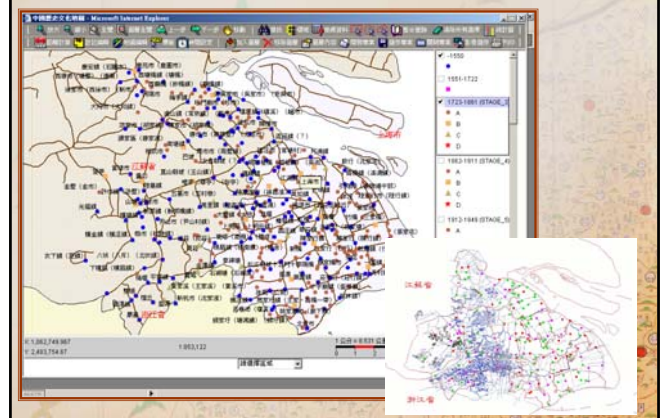
Using CCTS in Analyzing the Price Trends and Population Distribution in Qing Dynasty



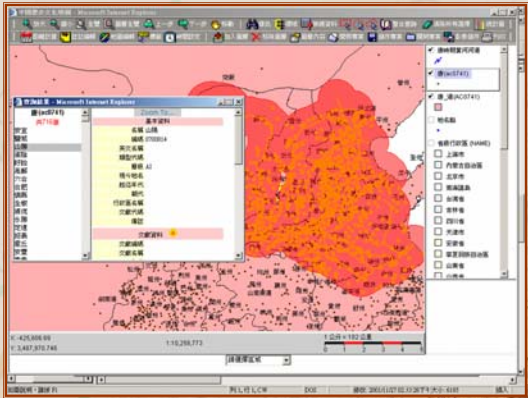
Key Functions of GIS

- Spatial Analysis
- Buffer Analysis

Analysis of the Jiangnan Market Towns in the Ming-Qing Dynasties



Buffer Analysis of Yellow River Floods in the Tang Dynasty



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Image Database

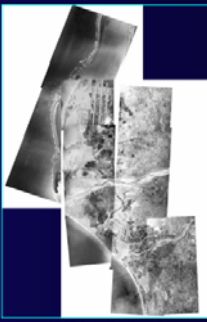
- China and Taiwan Map Database
 - More than 120,000 old Maps are Collected and Scanned into Computer
- China and Taiwan Remote Sensing Image Database
 - More than Millions of Aerial and Satellite Images are Processing

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1940s~50s Aerial Photos



1948年航照-基隆和平島一帶



1948年航照-曾文溪口

收集四〇~五〇年代航空照片
計有93條航線 3477張照片



Taipei City, 1947/09/15

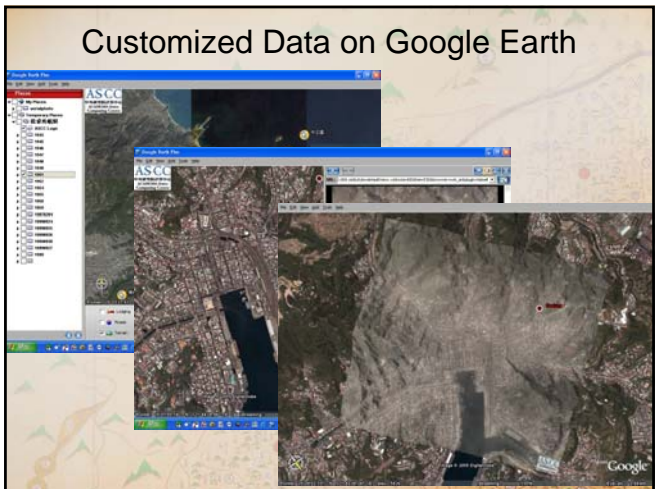
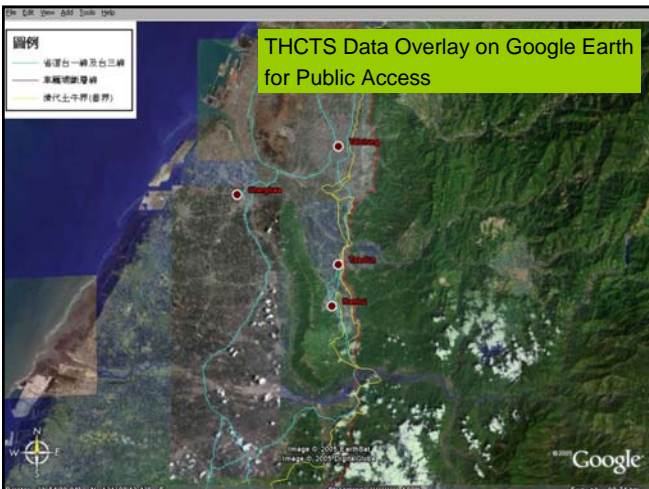
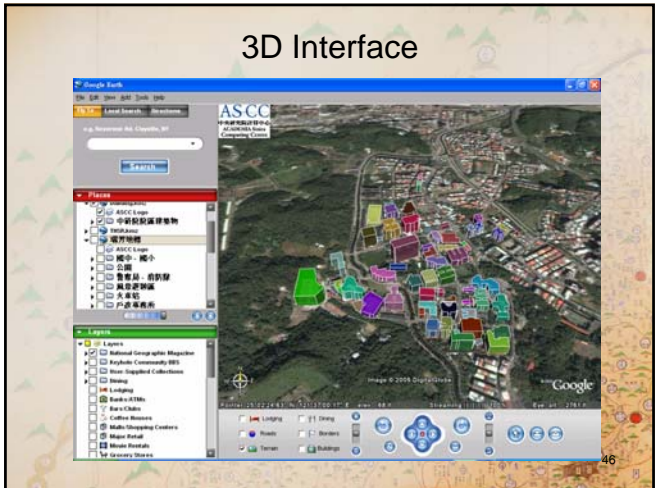
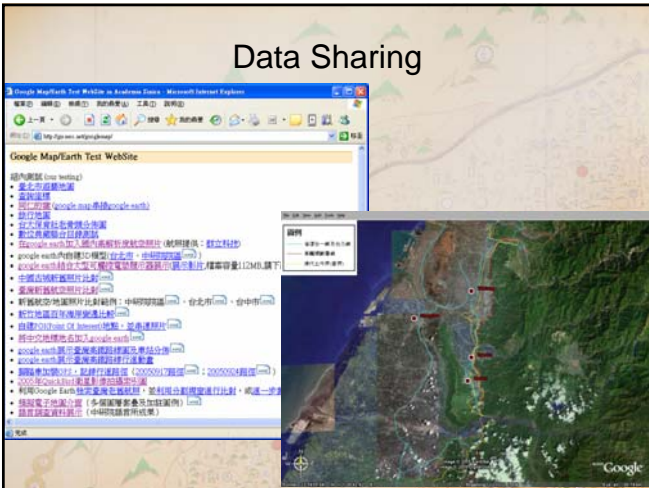
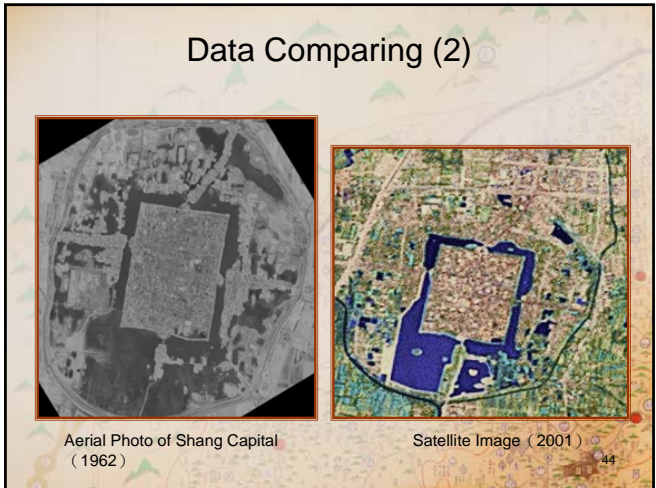
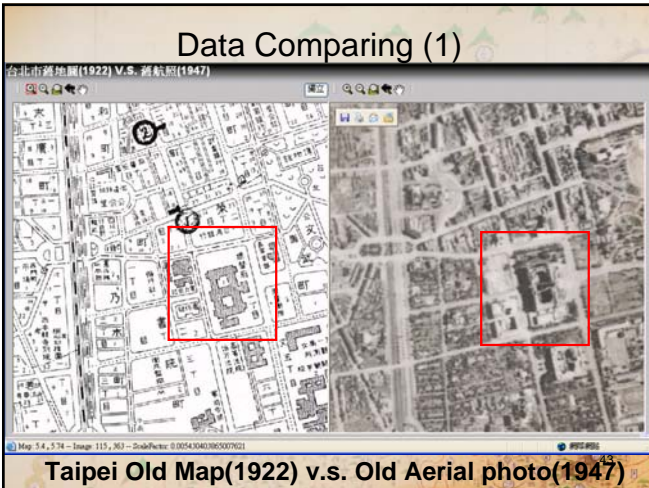


Taichung City, 1948/06/26



Searching Interface of Aerial Photos and Satellite Images

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Facilitate Thematic Research

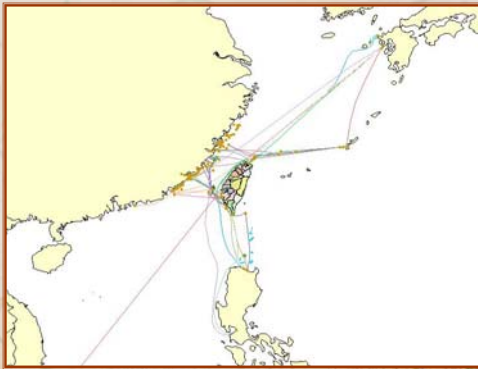
- Innovative Research Methods
- Integrate Research Resources
- Develop Historical Geographic Information System

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Mapping the Journeys of the Song Poet Su Dongpo



Nautical Charts along the Coast of Fukien and Taiwan since the Song Dynasty



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The Dispersal of the Formosan Aborigines in Taiwan 臺灣南島民族遷移圖

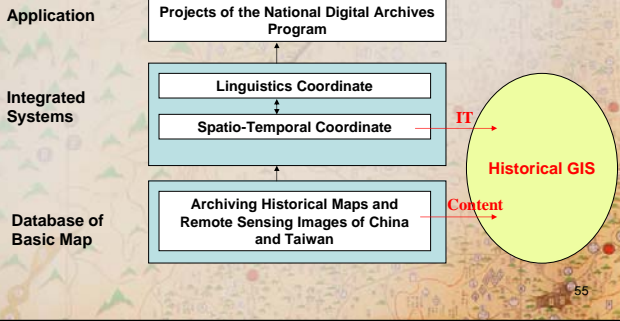


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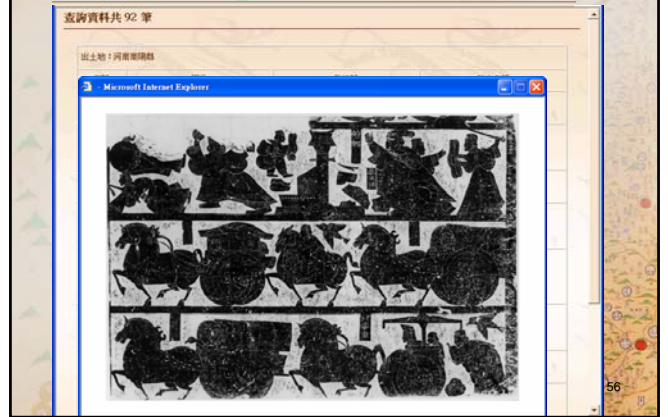
Yu Yong-he's journey across the Taiwan Strait in the Qing Dynasty



Historical GIS and National Digital Archives Program



Digital Archive Project of Rubbings and Archaic Texts



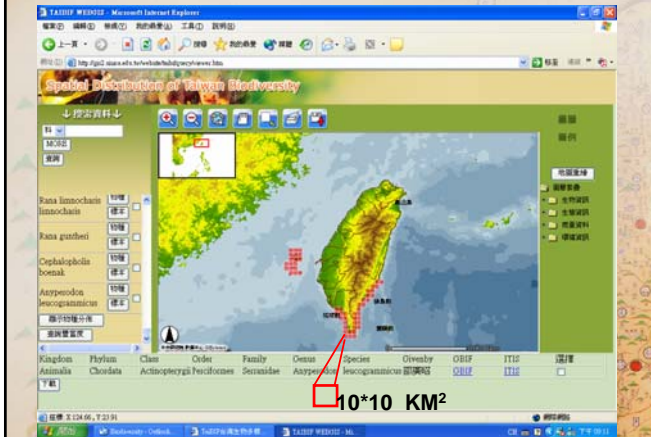
Digital Archives Project of Formosan Aborigines



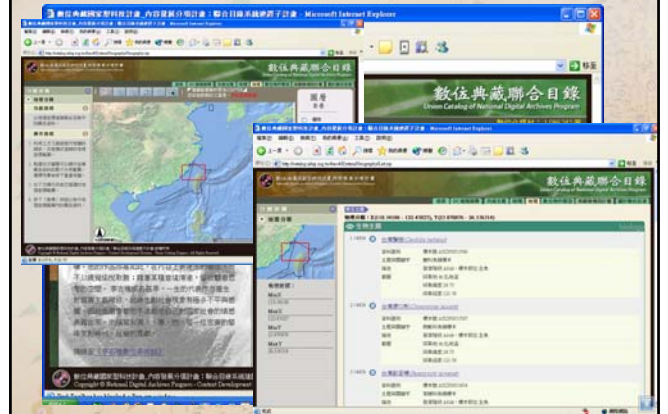
Biodiversity Project(1)- Plants



Biodiversity Project (2)- Fish



Union Catalog of National Digital Archives Program



Prospects

- Virtual Center for Sinological Studies
- Open Lab for China and Taiwan Studies
- Participatory GIS

