Chinese and Taiwan Historic GIS

(Chinese and Taiwan Civilization in Time and Space)

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Project Background and Objectives

- Space and time are the two most important elements that constitute history, culture, and environmental change.
- Until our projects worked out, there is no adequate digital Chinese and Taiwan history, culture and natural resources atlas which can serve as a comprehensive reference for scholars in Sinology studies.
- Through computer technology, traditional maps can be transformed into virtual reality which can be updated and integrated with various database.
Introduction of the Project

- The **CCTS (Chinese Civilization in Time and Space)** Project began in 1996 aims to build up fundamental system for historic GIS and basic data of Chinese History past 2000 years. The spatial resolution is about 1:1M~10M.

- The **THCTS (Taiwan History and Culture in Time and Space)** Project began in 2001 aims to develop a spatial-temporal application infrastructure on the basis of digitalized Taiwanese history, culture and natural resource maps past 400 years. The spatial resolution is about 1:20K~100K.
Content of the System

This system consists of three components:

- Geospatial base data
- WebGIS-based application
- Thematic map database

**Geospatial Base data**
- Administration Boundary
- Placename
- Basic vector data (like river, Mt)
- Image/Aerialphoto
- Statistics
- ...

**Thematic map database**
- Population
- Religion
- Military
- Natural Environment
- Public health
- ...

CCTS or THCTS
Content of the CCTS System

Chinese Civilization in Time and Space

Geospatial Information
- Admin. Boundaries from HAC
- Inhabited Localities from HAC
- Digital Map Databases of China (ArcChina)
- Digital Chart of the World (DCW)
- Changes of Yellow River
- Pre-historical Cultural Areas
- Gazetteers
- Historical Atlas and Remote Sensing Imagery

Thematic Information
- Scripta Sinica
- Grain Price and Population in Qing
- Beacon Tower Dist. In Eastern Han
- Union Catalog of Local Gazetteers
- DB of Person Names in Chinese History
- Dist. Archaeological Tombs in Han
- DB of Archaeological Sites of Silk Road in Hsinjiang
The Basic Dataset of the 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 Map from pre-Qin era to the Qing Dynasty
Administrative Boundaries and Place Names
• Changes of the Administrative Boundaries
The Basic Dataset of the CCTS: The Digital Map Database of China (Arc/China) (1:1,000,000)
The Dataset of ArcChina were from 1980 to 1990 with 13 features and 77 map blocks, published by the National Bureau of Surveying and Mapping, PRC.
The Shen Newspaper Atlas (1930s)
The Chinese Civilization in Time and Space System

1. A WebGIS-based infrastructure for content navigation and web mapping
2. Integrating geospatial and attribute information via the Internet
3. Users can upload data, create their own maps and save them in the client or server side.
maps
aerial photos
Content of the **THCTS System**

**Geospatial Information**
- Digitized Data from HAAT
- Digitized Data from TMHT
- Gazetteers of Each Period
- Admin. Boundaries of Each Period
- Current Digitized Base Map with large scale
- Statistic Data
- Modern Historical Atlas and Remote Sensing Imagery

**Thematic Information**
- Population Distribution
- Religion
- Education
- Military Defence
- Transportation Facilities
- Economy and Industry
- Government Control
- Public Health
- Aborigines
Taiwanese history can be divided into: Dutch and Spanish Period, Chings’ Dynasty, Qing Dynasty, Japanese Colonized Period and After WW II. Accord to that, we have developed various base maps of each period. Among them, 《Atlas of the historic administrative pau division of Taiwan》(1904), 《Atlas of the topography of Taiwan during the period of Japanese rule》(1920) and the newly published “Topography of Taiwan”, photographic maps and remote sensing images constitute the main body of base maps.
17th~19th old maps

- 康熙五十三年(1714) 測繪之臺灣地圖
- 永曆十八年(1664)臺灣軍備圖
- 慶東福建與臺灣海圖[卑南圖](1650-1660)
- 光緒五年(1879)臺灣後山總圖
- 清康熙中葉臺灣海圖
Early 20th topographic maps
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
Thematic Map Database of THCTS

We have integrated available researches in Taiwanese history and culture with base maps and system application infrastructure. Nine groups of thematic maps were produced, such as population distribution, religion, education and aboriginal people. In the future, we hope to make more value of this spatial-temporal infrastructure through active participation from scholars across different fields.
日治時期教堂分布圖

說明

日治時期教堂分布圖

說明

西教堂圖列標所指乃為西方天主教、基督教在台所設之傳教地點。在《台灣歷史文化地圖》中，特別標示出13與42所西教堂分布，兩地之西教堂分布情形，可讓我們大略看出當時教會傳道的足跡。

西方宗教與社會的傳播與荷蘭人、西班牙人在台的活動有關。基督教於1567年隨傳教士來台，並以高雄為傳教中心；而主教則隨著西班牙人，從基隆開始在北台灣發展。當時傳教的宣教對象皆以土著居民為主，著重開辦教育。然至清初，由於清政府對西洋教會的抑制，傳教活動遂止。直至鴉片戰爭後，西方宗教再度活躍。1861年郭欽講師又創建萬金天主堂，是台灣現存最古老的教堂。在基督教方面，則有馬雅各（James L. Maxwell）、李維(Hugh Ritchie)、馬偕(Edward R. Mackay)等，分別在南、北台灣進行傳教，並分建台南新營醫院(1863)與淡水馬偕醫院(1873)；開設教堂醫院之始。而日本人來台，亦將日本西洋宗教的發展帶至台灣，使西方宗教的發展更為多元、活躍。

西方宗教在傳教同時，也帶來了許多西式的教育精神，醫療設施與技術等西方式現代化發展成果，而這也是日治之前台灣與西方文化交流的重要方式。此外，當初所設置的學校與醫院，許多至今依然流傳、造福台灣。
System Structure of the CCTS an THCTS
Applications of CCTS

Integration and Retrieval of Data
• Integration with Scripta Sinica
• Searching the Bibliography of Chinese Local Gazetteers (Local History)
Applications of CCTS

Application of Digital Archive Project
• Integration with 人名權威檔 of Fu Shi-Nien Library
• Distribution of the Han Tombs & Temples
• Mapping the Journeys of the Song-dynasty Poet Su Dongpo
Applications of CCTS

Spatial Analysis
• Price Trends and Population Distribution during the Qing Dynasty
• Buffer Analysis for the Flooding of the Yellow River during the Tang Dynasty
• Overlay Analysis of the Ming-Qing Jiangnan Market Towns
Applications of THCTS

Regional study: Tainan, Taiwan For Example
17~18th century coastline
17~18th century coastline and old placename collected from old map
17~18th century coastline and Satellite Image in 1940s
17~18th century coastline and Satellite Image in 2001
19th century coastline in Tainan, Taiwan
Early 20th century coastline
Early 20th century coastline and placename
The Old Map overlaid the Admin. Boundary Data in Tainan, Taiwan (1904)
Topographic Map in Tainan, Taiwan 1920
Landuse in Tainan, Taiwan (1920)
Brief Summary

- The **CCTS (Chinese Civilization in Time and Space)** Project was covered large spatial and temporal extend and builded up historic features using off-the-shelf historic geography study.

- The **THCTS (Taiwan History and Culture in Time and Space)** Project has high spatial and temporal resolution and builded up historic features from the first-hand historic study using GIS. The thematic maps are distinguishing feature.
Current Works

- **More Data**
- **Developing integration Interface to ECAI cleanhouse and the other Web-GIS portal site with standard protocol**
- **Promote the usage of the both systems**
  - UC Berkley and Colombia Uni. have installed the CCTS.
  - Major universities library in Taiwan have be authorized to use.
- **Working with National Digital Archives Project in Taiwan**
- **Developing Web-GIS client-side display environment using GML and SVG**
- **Testing Web-Editing Function in CCTS and THCTS**
- **Porting Web-GIS to Grid services**
Future Prospects

• *Open Lab for China and Taiwan Studies*
  – Creation of Customized GIS Project

• *Geolibrary*
  – Cross Cultural and Multi-Lingual Compatibility of Formats
  – Information System Integration
  – Clearinghouse & Protocol for the Domain Knowledge of China and Taiwan Studies

• *Virtual Center of Sinological Studies*
Thank you for your Attention

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