

# 中華歷史地理資訊系統的建立與應用

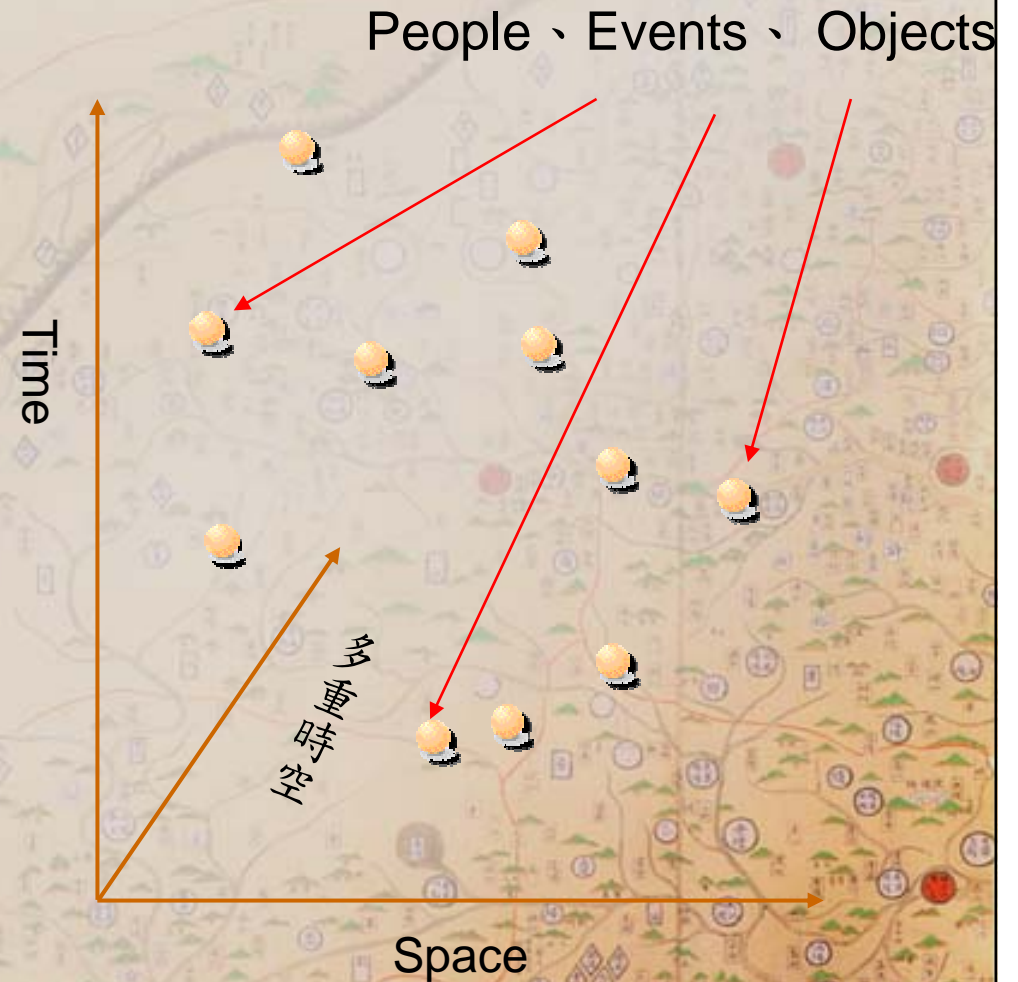
—中央研究院 Academia Sinica—

# Background

- Temporal and spatial attributes of people, events, and objects

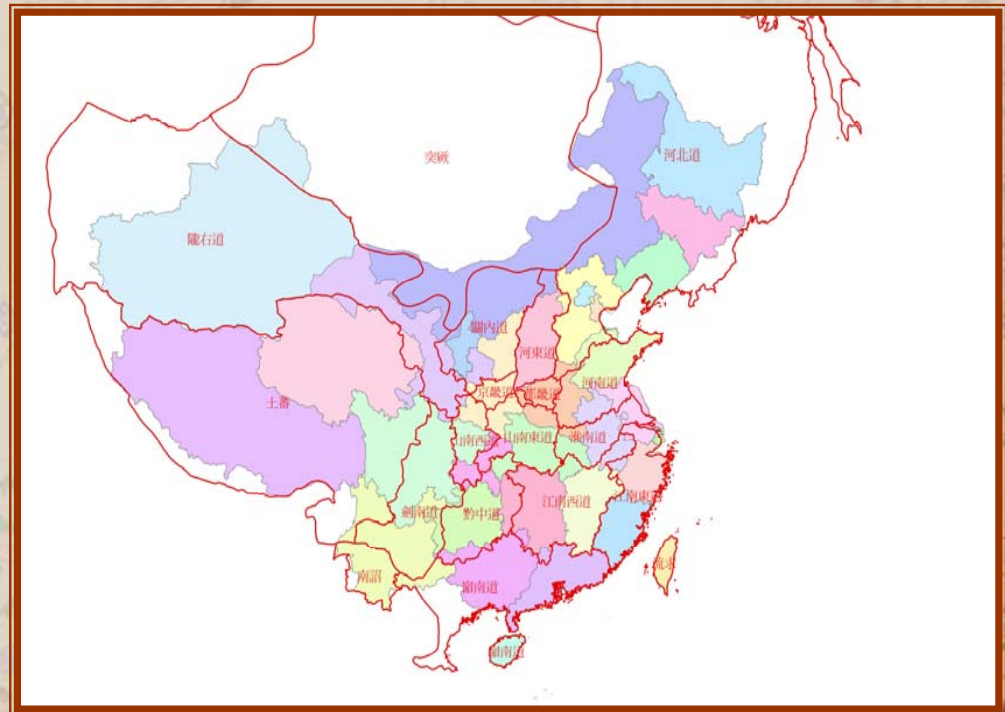
Spatio-temporal coordinates

- Traditional methods and tools have their limits in integrating temporal and spatial attributes



# Ideas

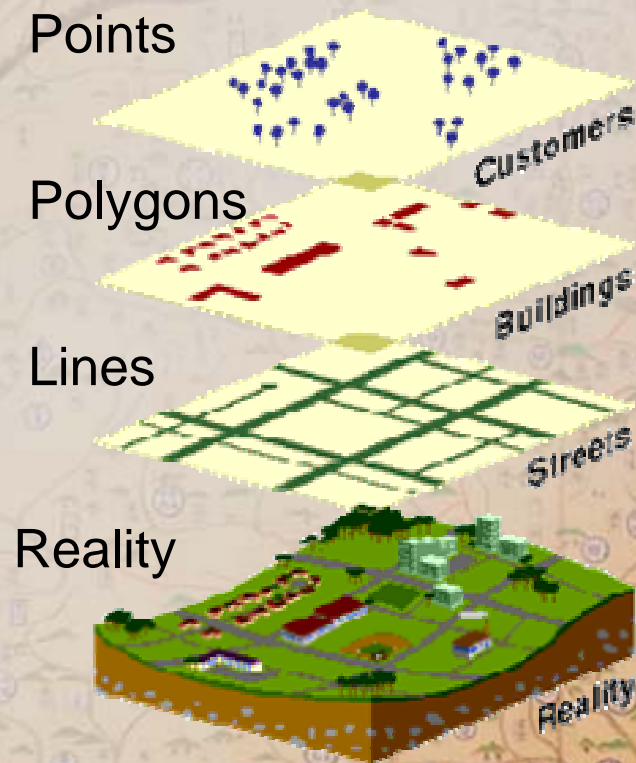
- Manage spatial attributes  
Time-Space  
Past-Present
- Create visual effects
- Construct a system environment which suits human cognitive model





# Methods

- Establish a Web-GIS environment by integrating GIS ( Geographic Information System) and internet technology
- Integrate maps and remote sensing (aerial and satellite) images
- Construct Historical GIS





# Accomplishments

Two virtual spatiotemporal infrastructure:

Chinese Civilization in Time and Space, CCTS

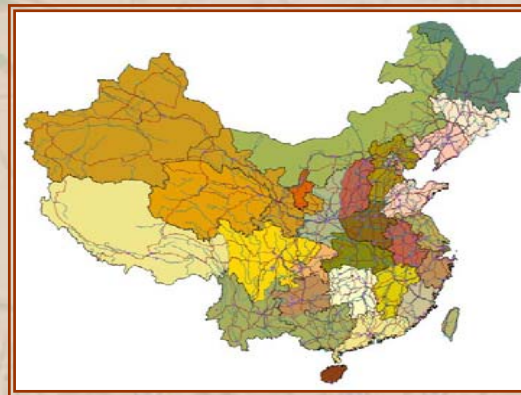
Taiwan History and Culture in Time and Space, THCTS

# Chinese Civilization in Time and Space, CCTS

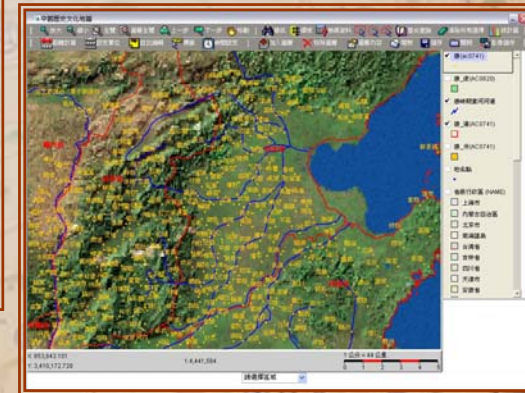
- Overlay Dr. Tan' s 《 *The Historical Atlas of China* 》 and 《 *Arc/China* 》 ( 1 : 1,000,000) and construct a spatio-temporal framework of more than two thousands years.



The Historical  
Atlas of China



Arc/China

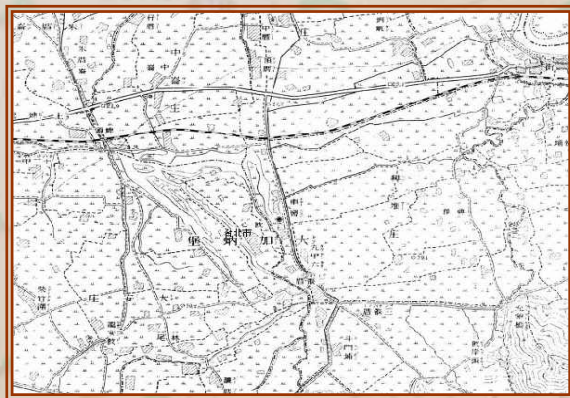


User Interface

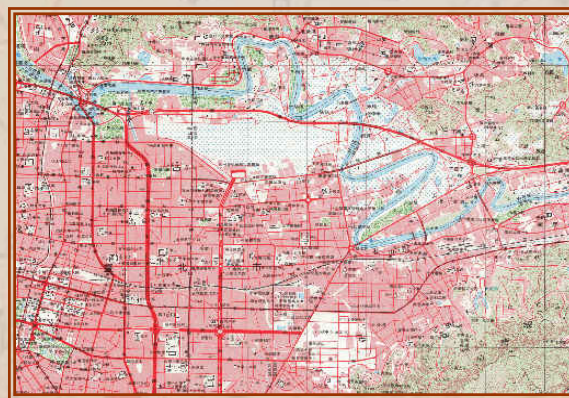


# Taiwan History and Culture in Time and Space, THCTS

- 《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” and remote sensing images, constitute the main body of base maps. These base maps cover four different periods of Taiwan history: the “Dutch and Spanish Period” , the “Chengs’ Dynasty” , the “Qing Dynasty” , the “Japanese Colonized Period” and After WW II.



《Atlas of the historic administrative pau division of Taiwan》



《 Topography of Taiwan 》



User Interface



# Applications

- Integrate Academic Resource
- Facilitate Thematic Research
- Promote Knowledge dissemination

# Integrate Academic Resource

- Literature database
- Statistical database
- Image database

# Literature Database

- “Scripta Sinica”
- “Bibliography of Chinese Local Gazetteers”
- “Taiwan Research Network”
- “Taiwan Geographic Name Information System”
- 「臺灣總督府檔案資料庫」



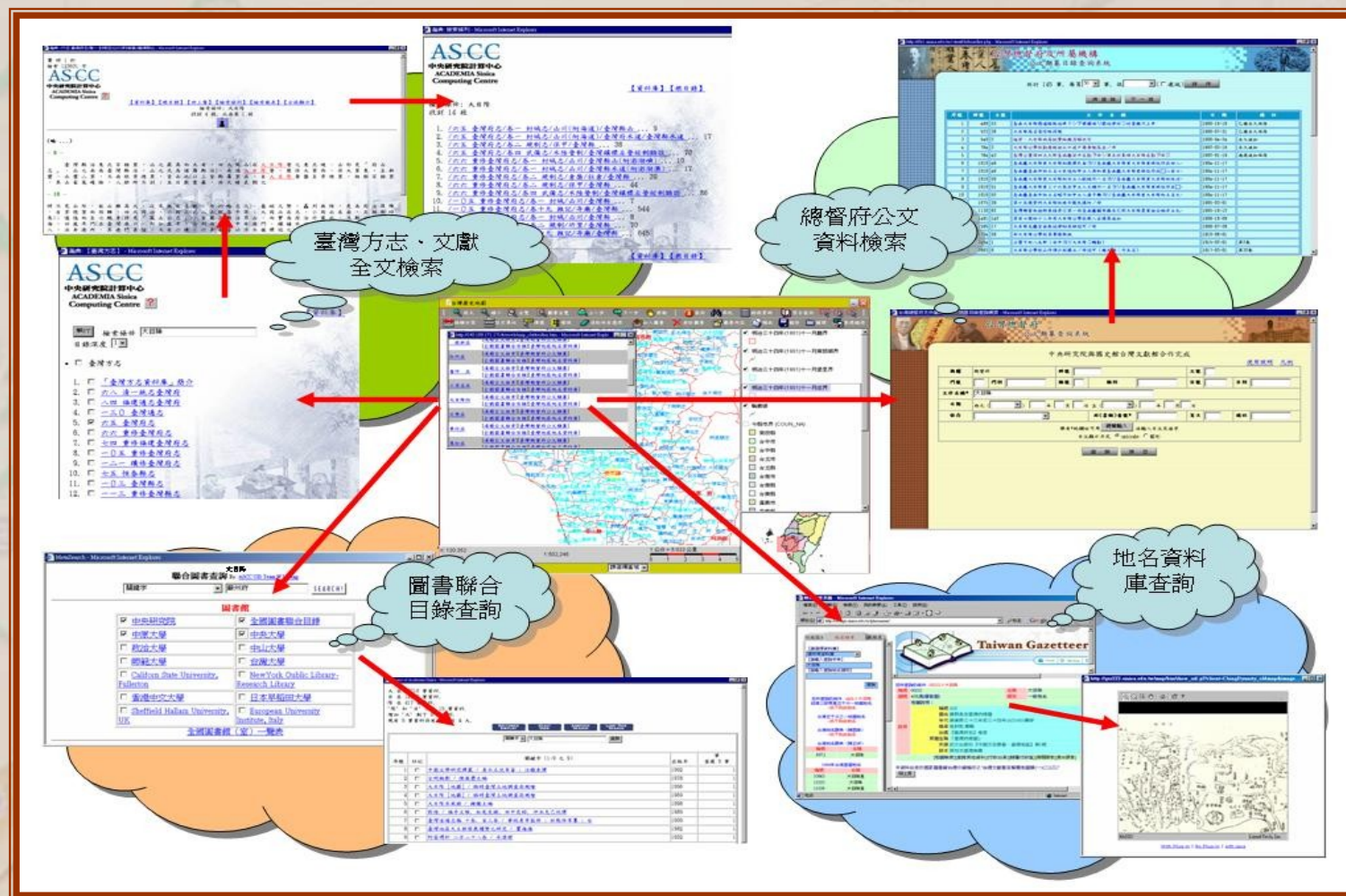
Integration with “Scripta Sinica” in CCTS:  
Both new and historical place names on the digital map can be linked to many databases, which contain related articles and bibliography in literature.

The screenshot displays the CCTS interface, which integrates historical and geographical data. The main window shows a digital map of China with various place names highlighted. A sidebar on the left lists several databases, including '漢籍全文檢索' (Han Dynasty Full-text Search), '全國圖書聯合目錄' (National Union Catalog), and '地方誌檢索' (Local Gazetteer Search). The '蘇州府' (Suzhou Prefecture) is selected, and a search results window is open, showing a list of 795 segments. The results are displayed in a table with columns for '段號' (Segment Number) and '段名' (Segment Name). The search results are as follows:

段號	段名
1.	/新校本史記三家注/新校本史記/本紀/卷二 夏本紀第二 ... 58
2.	/新校本史記三家注/新校本史記/本紀/卷三 殷本紀第三 ... 100
3.	/新校本史記三家注/新校本史記/本紀/卷四 周本紀第四 ... 115
4.	/新校本史記三家注/新校本史記/書/卷二十七 天官書第五 ... 1343
5.	/新校本史記三家注/新校本史記/世家/卷三十一 吳太伯世家第一 ... 1445
6.	/新校本史記三家注/新校本史記/列傳/卷六十六 伍子胥列傳第六 ... 2180
7.	/新校本史記三家注/新校本史記/列傳/卷六十九 蘇秦列傳第九 ... 2255
8.	/新校本史記三家注/新校本史記/列傳/卷七十八 春申君列傳第十八 ... 2390

The search results window also includes a '檢索條件' (Search Conditions) section, showing '蘇州' (Suzhou) as the search term and '找到 795 段' (Found 795 segments). The interface also features a '資料庫' (Database) section with a list of databases and a '檢索' (Search) button. The background map shows the location of Suzhou in the Jiangnan region of China.

# Integration of place names with digitized literature database in THCTS:



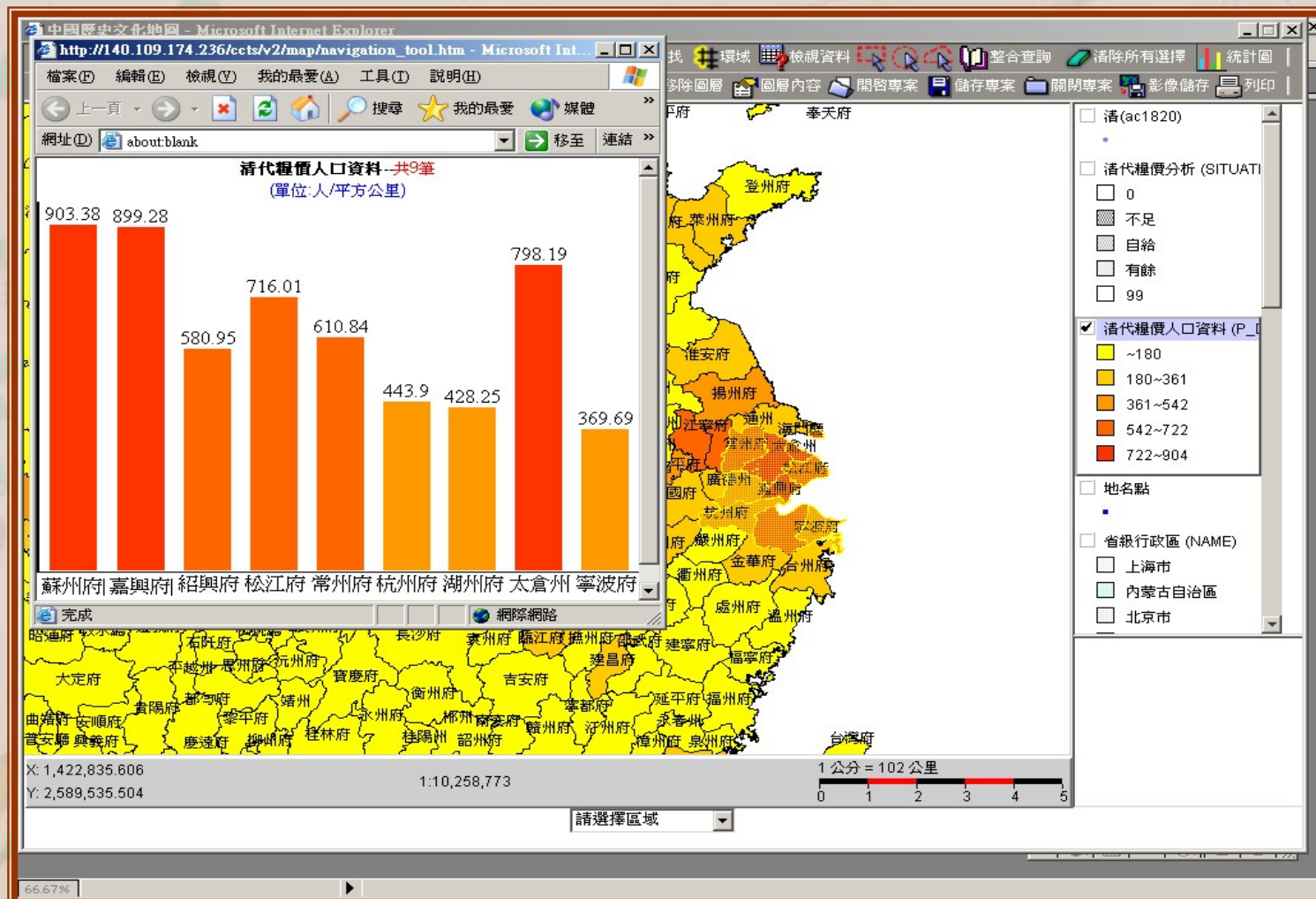


# Statistic Database

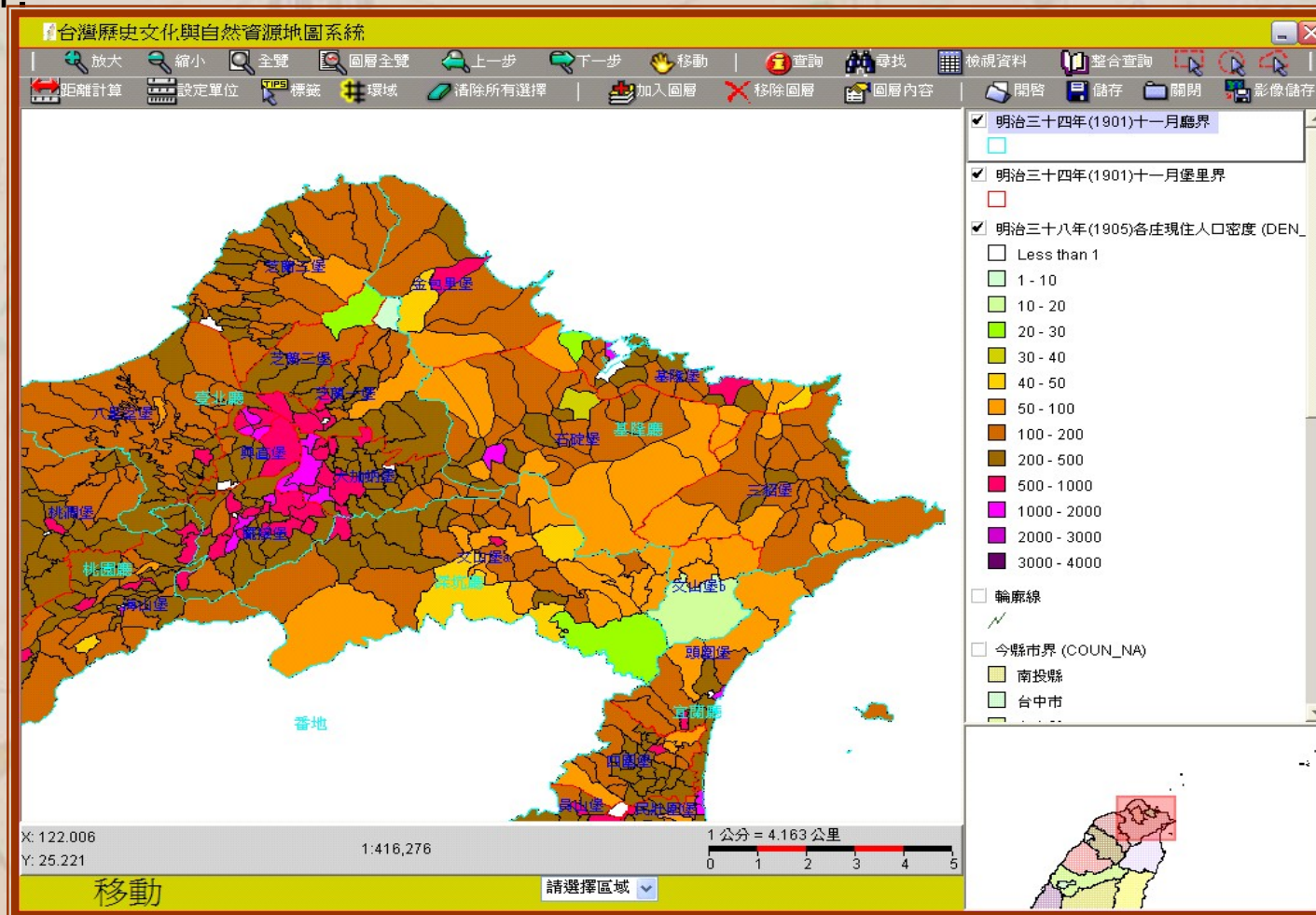
- “Grain Price and Population in Qing”
- “Taiwan Population Statistics in early Japanese Colonized Period”



The application of CCTS in the analysis of “Price Trends and Population Distribution in Qing Dynasty” : visualizes statistic data and helps analyzing traditional economic pattern.



We established a precise administrative boundary of Japanese Colonial Period by digitizing historic maps. Also, by integrating various kinds of statistic data (e.g. population, industry...) with maps, we produced choropleth maps depicting various socio-economic characteristics. The example shows the distribution of population density of northern Taiwan in 1901.



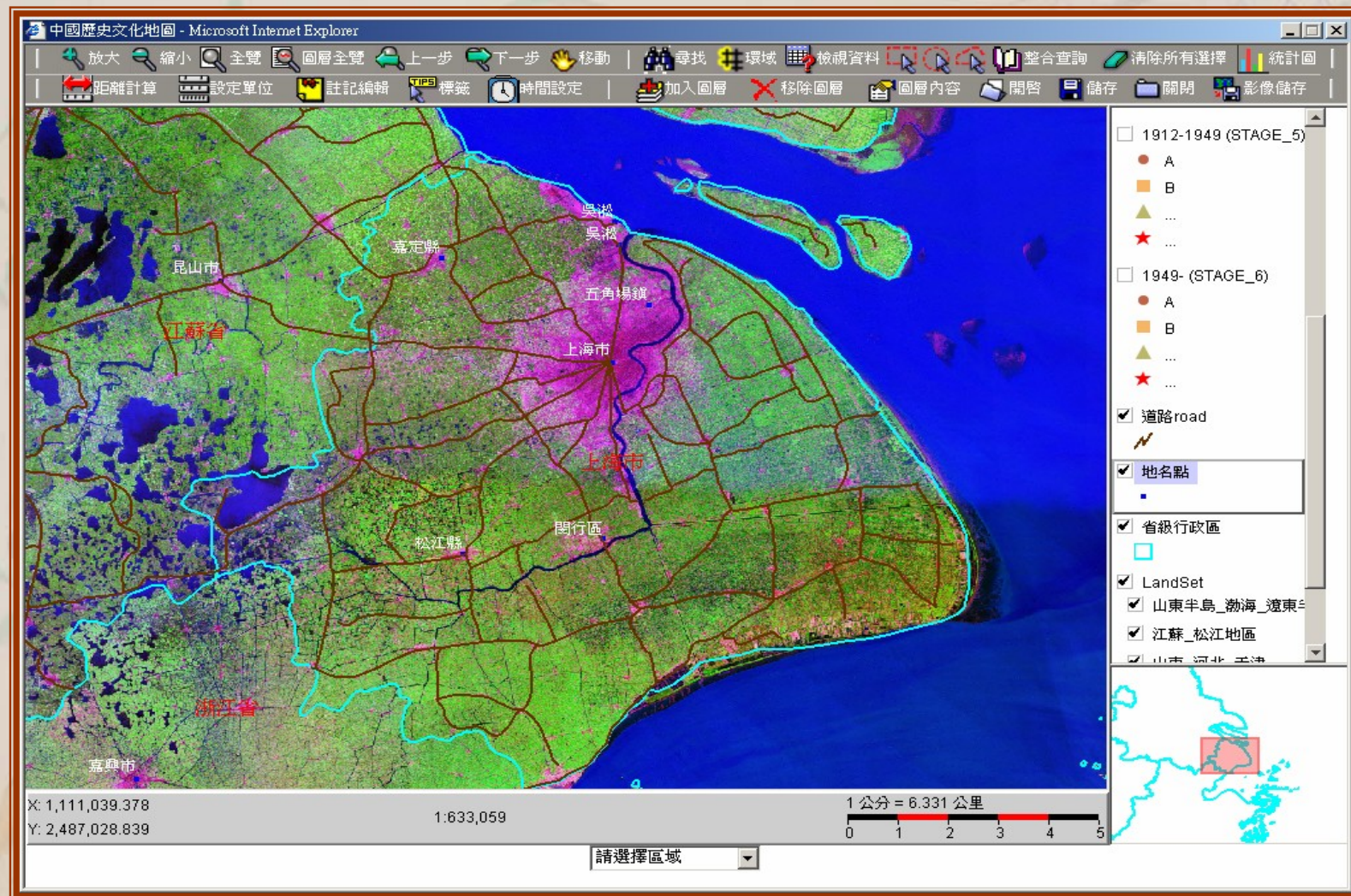


# Image Database

- China and Taiwan Map Database
- China and Taiwan Remote Sensing Image Database

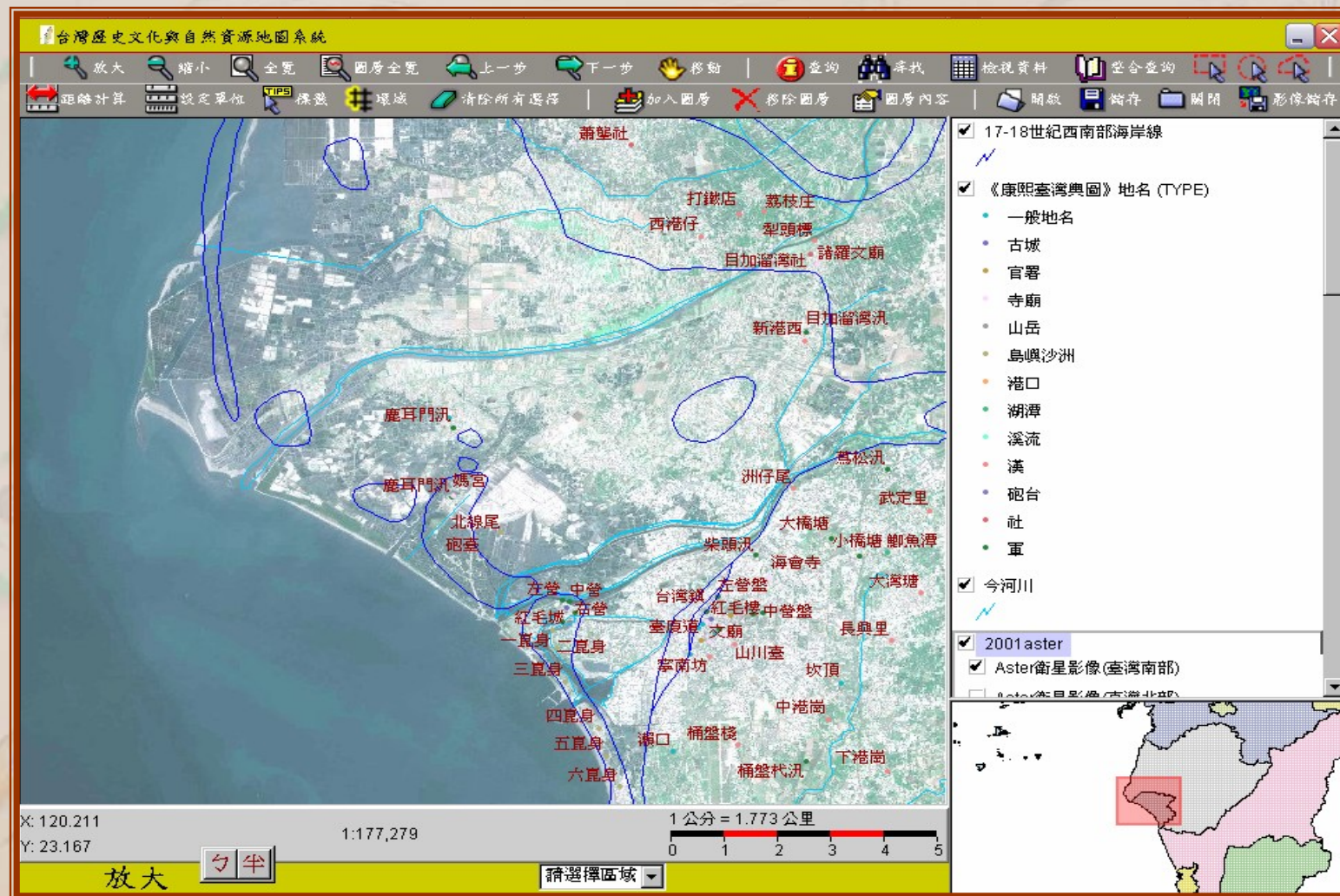


Overlaying different types of spatial data (e.g. maps, satellite images, and aerial photos) would help researchers understand the environment of a place. The map below shows an overlay of Shanghai map and Landsat pseudo-color satellite image.



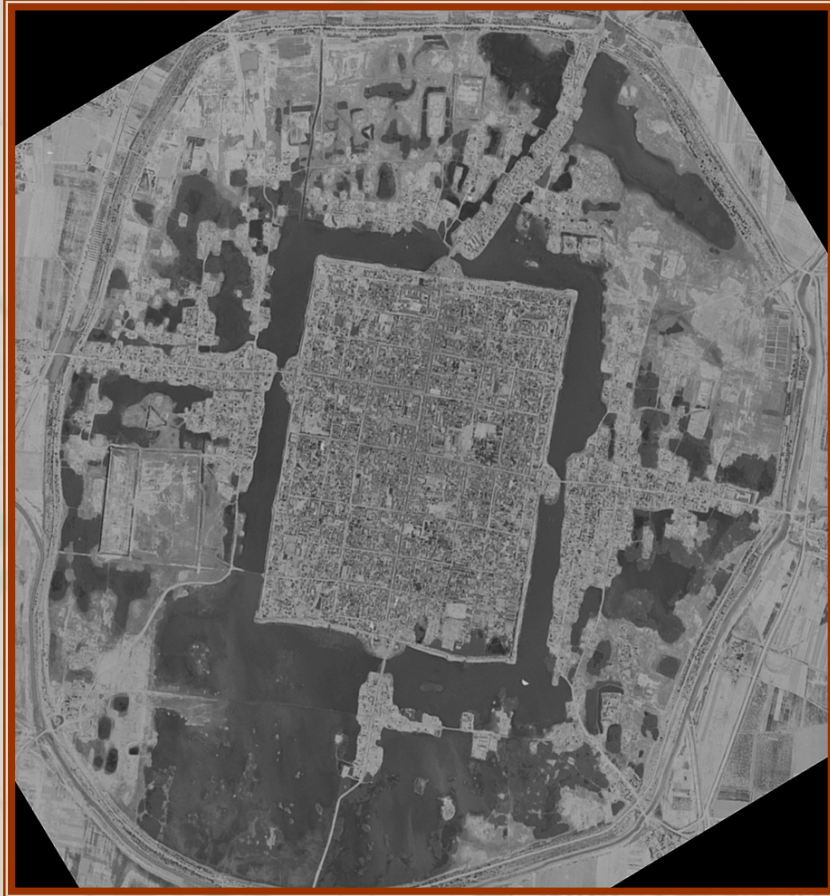


THCTS contains rich spatial data. Overlaying spatial data of different types and time periods facilitates analysis and comparison of information. The map below shows the seacoast transformation of Tainan area in the 17th and 18th century.





# Ying Dynasty Relic



Ancient City of Shang Dynasty  
Aerial Photo ( 1962 )



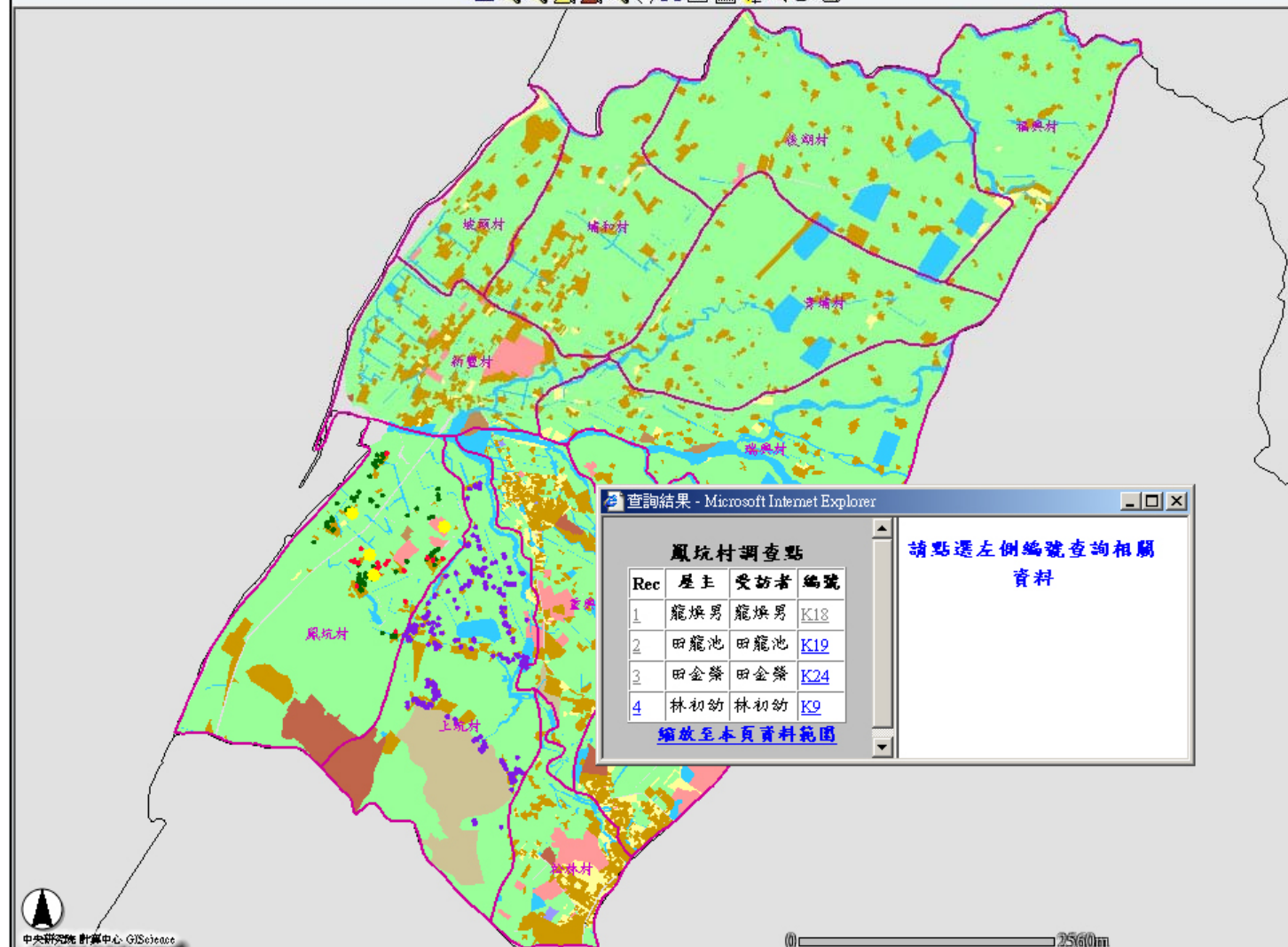
Satellite Image ( 2001 )

# Facilitate Thematic Research

- Innovate research methods
- Integrated research resources
- Develop historical Geographic Information System



# 新竹縣新豐鄉語言調查之空間資訊系統



中央研究院 計算中心 GIScience

放大

查詢結果 - Microsoft Internet Explorer

請點選左側編號查詢相關資料

Rec	屋主	受訪者	編號
1	龍煥男	龍煥男	K18
2	田龍池	田龍池	K19
3	田金榮	田金榮	K24
4	林初幼	林初幼	K9

[縮放至本頁資料範圍](#)

## 圖層

圖層選擇

- ☒ 鳳坑村調查點
- ☒ 上坑村調查點
- ☒ 村里界
- ☐ 街廓
- ☒ 土地利用
- ☒ 鄉鎮界

重畫地圖

請選擇 基本資料

- 國小
- 60以上
- 男
- 客家語

請選擇 詞彙

- 雨

送出 重設

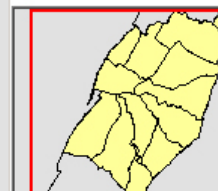
## 查詢結果

編號: K9  
受訪者: 林初幼  
年齡: 71  
性別: M(男)  
教育: 國小  
職業: 農  
出生地: 鳳坑村  
居住村莊: 鳳坑  
方言: 客家語  
詞彙: liorj

編號: K18  
受訪者: 龍煥男  
年齡: 66  
性別: M(男)  
教育: 國小  
職業: 自由業  
出生地: 新竹縣  
居住村莊: 鳳坑  
方言: 客家語  
詞彙:

編號: K19  
受訪者: 田龍池  
年齡: 70  
性別: M(男)  
教育: 國小  
職業: 無  
出生地: 鳳坑  
居住村莊: 鳳坑  
方言: 客家語  
詞彙:

編號: K24  
受訪者: 田金榮  
年齡: 81  
性別: M(男)  
教育: 國小  
職業: 無  
出生地: 鳳坑村  
居住村莊: 鳳坑



「鳳坑村調查點」為現在啟動的圖層



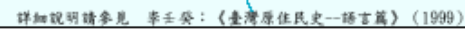
數位典藏國家型科技計畫



中央研究院

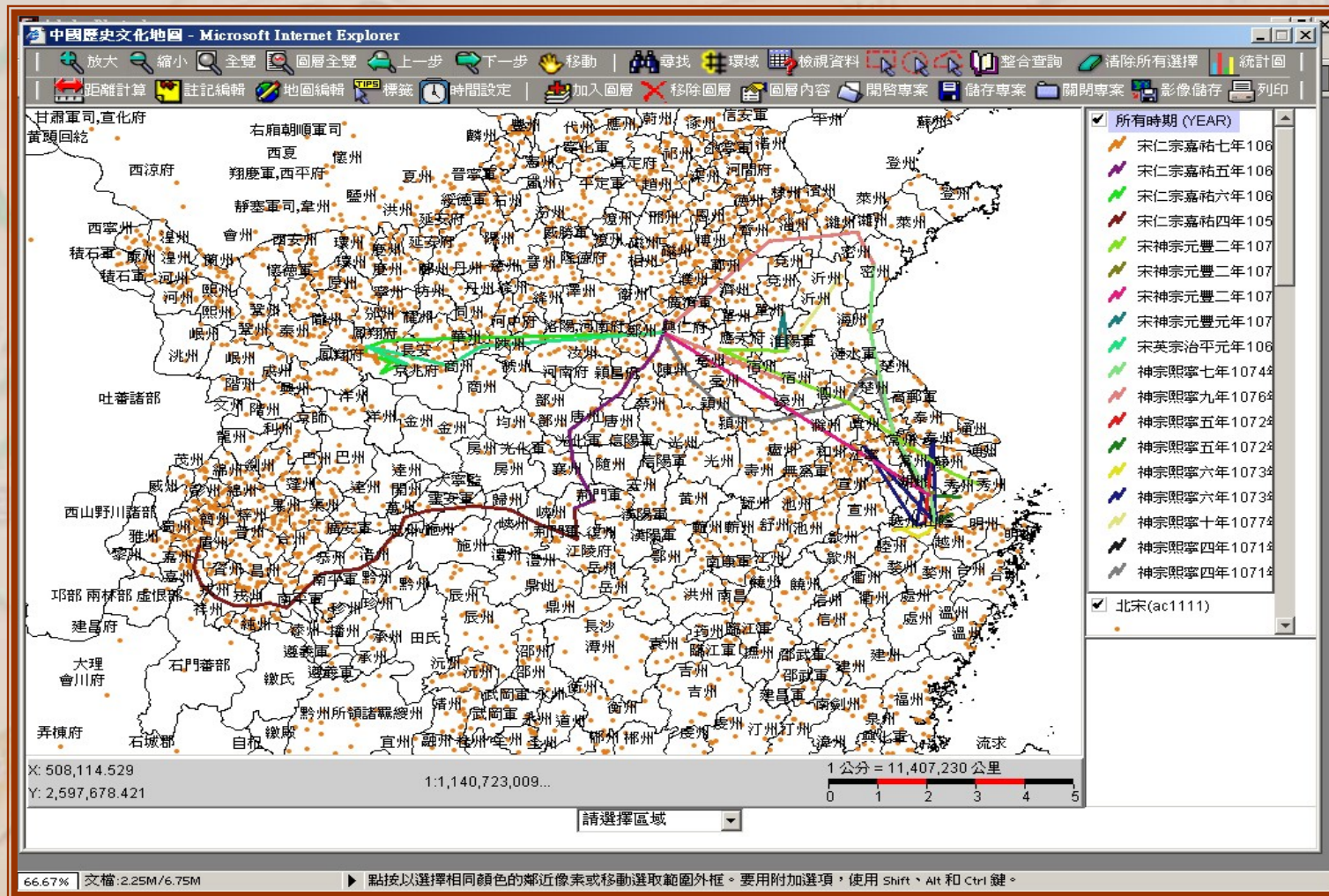
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## 臺灣南島民族遷移圖





In geographic names database, historical names can be marked-up. In the project of “Mapping the Journeys of the Song-dynasty Poet Su Dongpo”, researchers used geographic names database in CCTS to map Su’s travel route. By tracing his journey, researchers can look into the spatio-temporal background of Su’s literature.



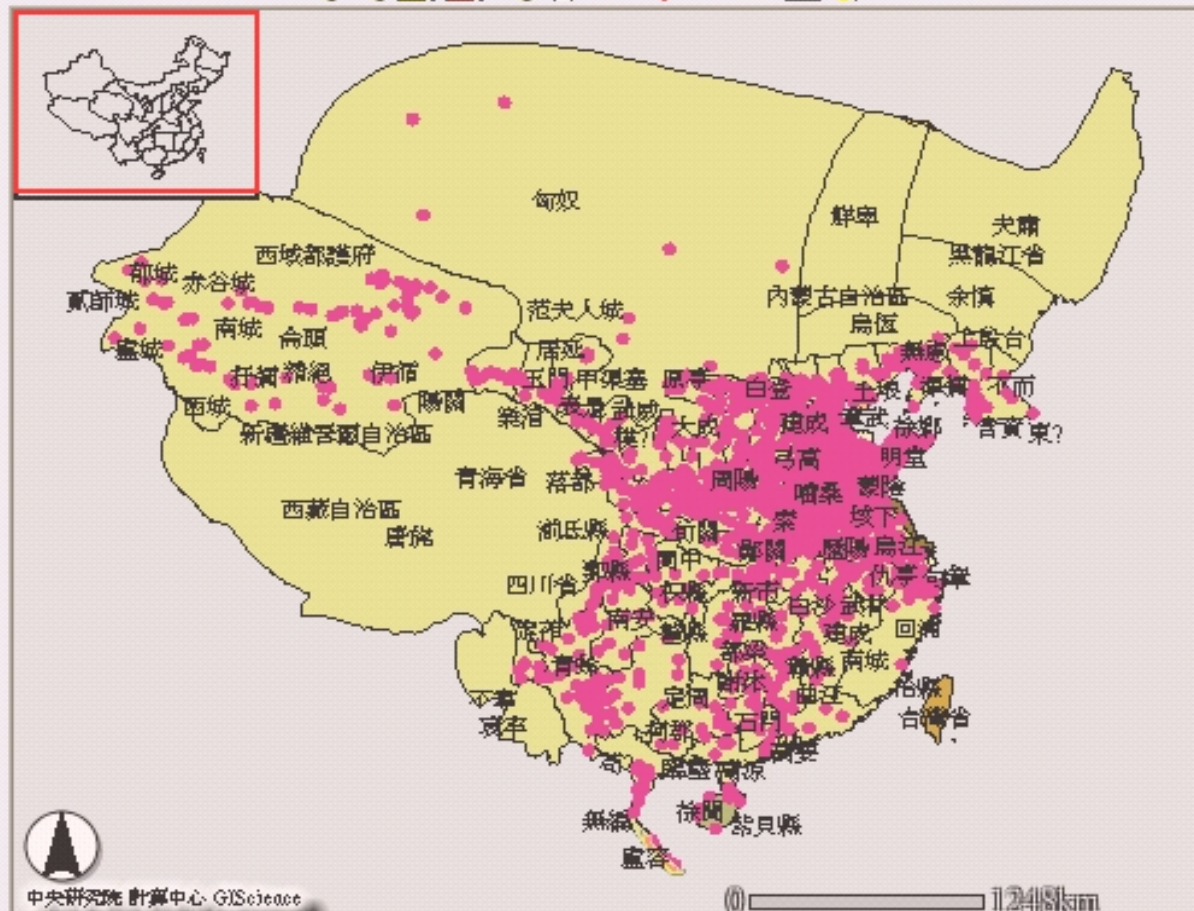




# 漢代石刻畫像出土地查詢系統

[系統簡介](#) [操作說明](#) [回資料庫](#)

朝代： 疆域政區： 郡國：



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放大

0 1248km

圖層

資料

## 圖層

泰疊叠得

- ☒ ☐ 西漢地名
- ☐ ☐ 東漢地名
- ☐ ☐ 現代地名
- ☒ ☒ 西漢地圖
- ☐ ☐ 東漢地圖
- ☒ ☐ 現代地圖

重畫地圖

『西漢地圖』為現在啟動的圖層



數位典藏國家型科技計畫

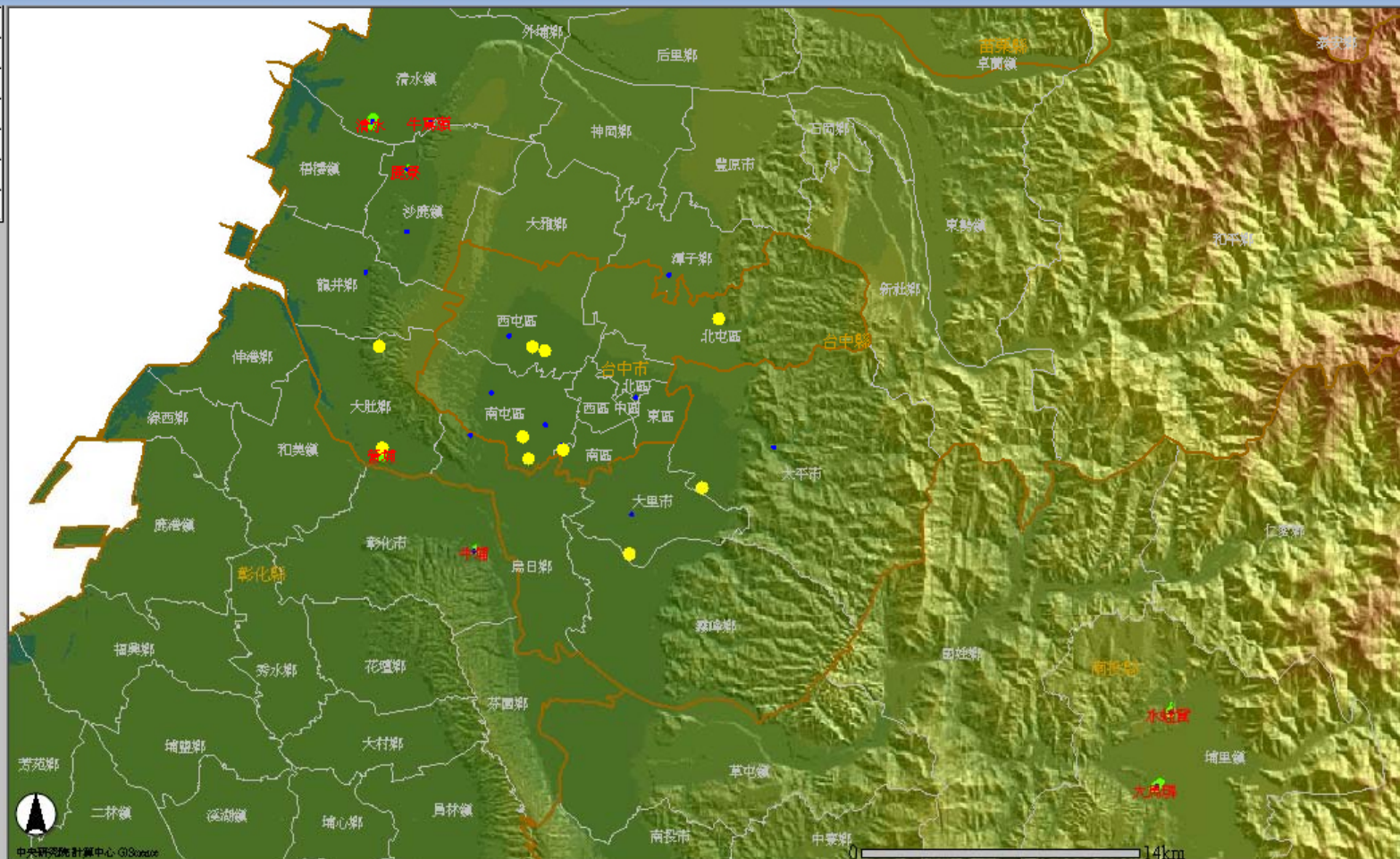


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## 臺中科博館考古典藏空間資訊系統



- ### 圖層
- 多重選擇
- ☒ 遺址發掘地點
  - ☒ 遺址
  - ☐ 今河川
  - ☒ 今縣市界
  - ☒ 今鄉鎮界
  - ☒ 地形圖

重畫地圖

由文化類型查詢遺址分布

管埔文化

送出

重設

遺址發掘地點

Rec	文化類型	遺址名稱	編號	#SHAPE#
1	管埔	馬龍潭		[point]
2	牛罵頭, 管埔, 番仔園	龜山	10	[point]
3	管埔, 番仔園	龍井		[point]

放大



數位典藏國家型科技計畫



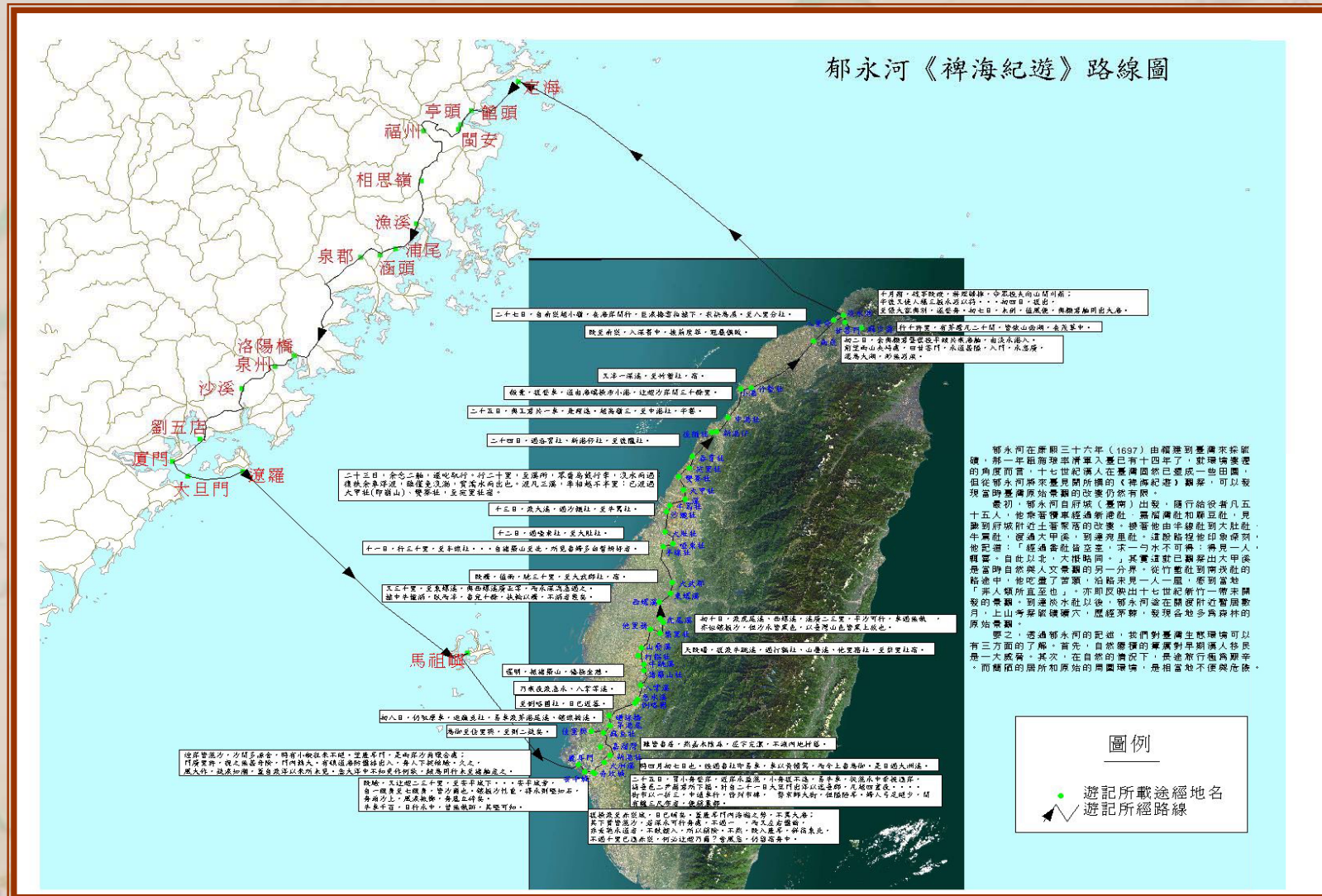
國立自然科學博物館



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「A Travel Log Across the Sea」 records Yu' s journey across the Taiwan Strait from mainland to the island of Taiwan during the Kangxi reign. The journal provides detailed accounts of geographic locations of the towns visited, as well as the contemporary human landscape and ecological environment of Taiwan.





The system identifies place names and features of old maps on modern maps based on current research results. Researchers are therefore able to overlap multi-period data and reinforce the confirmation and analysis of the researches via dynamic linkage between spatial-related documents and verification information.

大台北古地圖考釋 - Microsoft Internet Explorer

檔案(F) 編輯(E) 檢視(V) 我的最愛(A) 工具(T) 說明(H)

地址(D) <http://gis221.sinica.edu.tw/website/tpdumap/viewer.htm>

大台北古地圖考釋

地圖顯示大台北地區的古地圖考釋結果。地圖上標註了多個地點，包括：

- p13 Sprijt van Kimassouw
- p15 Swavel spruijt
- p16 Ruijgen Hoek
- p17 Ritsouquie revier
- p18 Spruijt nae Gaijsan
- p19 Pinnonouan Revier
- p31 Jagers veldt

右側表格顯示了地點的詳細信息：

ID	地名	大略位置	譯名	辨正	舊說
p13	Sprijt van Kimassouw	即礦溪	麻少翁溪支流	唐素娟：士林平原上的礦溪，係流入雙溪後再並入基隆河，因此此溪究竟是礦溪或是雙溪，難以斷定。鄧國雄：此流應為今日的雙溪，因河口流經麻少翁社，故取名麻少翁小溪。謝英宗：此溪應為礦溪。	
p15	Swavel spruijt	貴子坑溪(?)	礦溪	唐素娟：貴子坑溪位於開渡平原北端，方位上No.16開渡到No.32奇難龜崙社間的溪流反而比較接近。故本號應非貴子坑溪。鄧國雄、謝英宗：此溪應為今流經北投，通往地熱谷及大磺嘴地熱區的「礦港溪」，而非礦溪或貴子坑溪。謝英宗：貴子坑溪應是No.15、No.16之間的小溪。	
p16	Ruijgen Hoek	開渡	野生灌木林河角		
p17	Ritsouquie revier	基隆河	里族河		
p18	Spruijt nae Gaijsan	五股冷水坑溪	往海山之溪	唐素娟：此溪應是場仔坑溪。	
p19	Pinnonouan Revier	新店溪流城	武?灣溪		新店溪
p31	Jagers veldt	五股鄉冷水坑溪北之威仔寮	狩獵園、獵場	唐素娟：威仔寮是在場仔溪流流域。	

本頁顯示筆數 13 筆

NUM\_ID

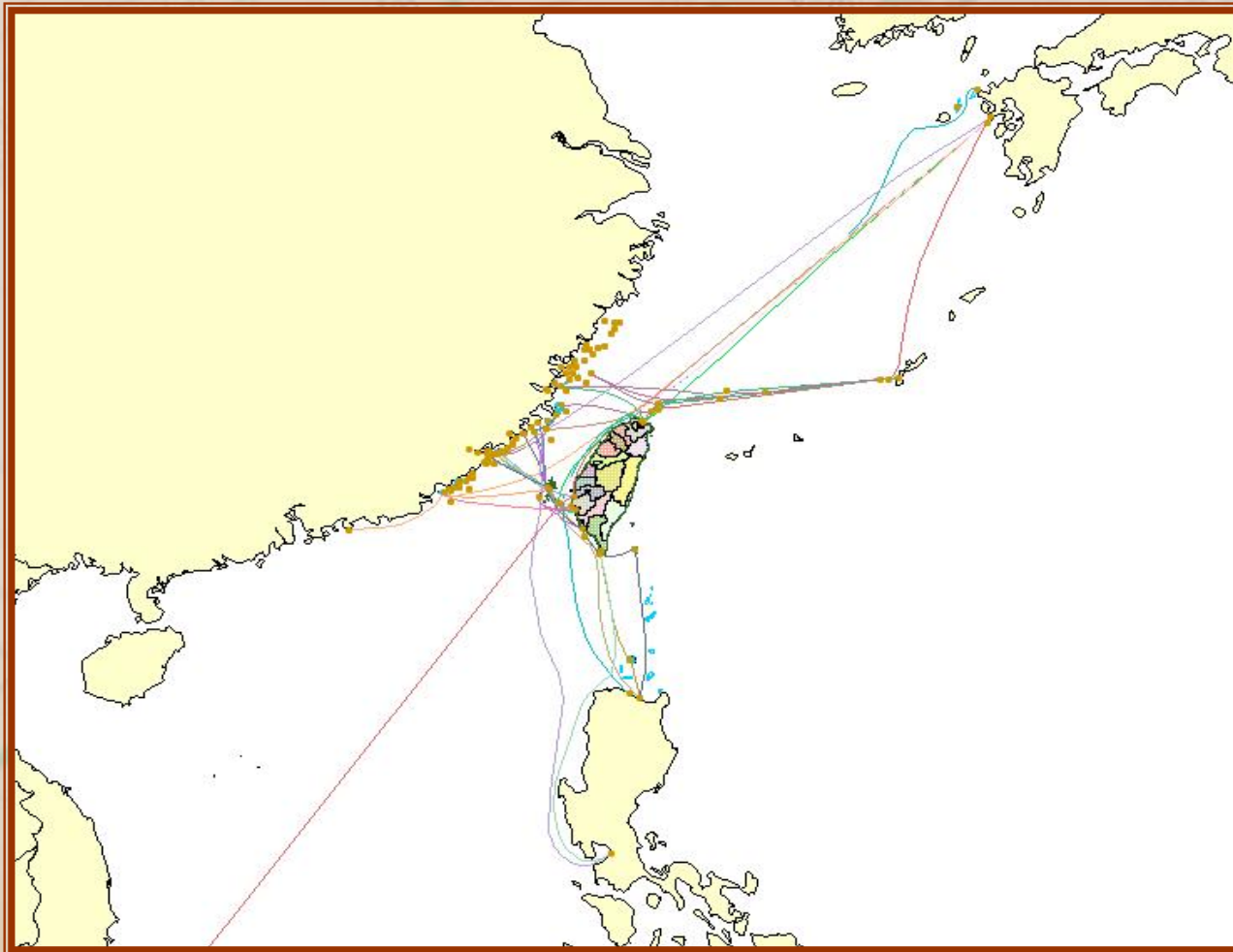
- p33
- p34
- p35
- p36
- p37
- p38
- p39
- p40
- p41
- p42
- p43
- p44

放大至本頁所選範圍

27

# Map of Fu-kien and Taiwan area marine routes

'Map of Fu-kien and Taiwan area marine routes' combines the various marine routes based on compass records during the Sung and Yuan dynasty. It shows the most frequently used marine routes for transportation in the areas surrounding Fu-kien and Taiwan since the Sung dynasty. The Penghu archipelago had a dominant role in the marine-time history for its middle way location between mainland and Taiwan, and is also used as shelter during foul weather.



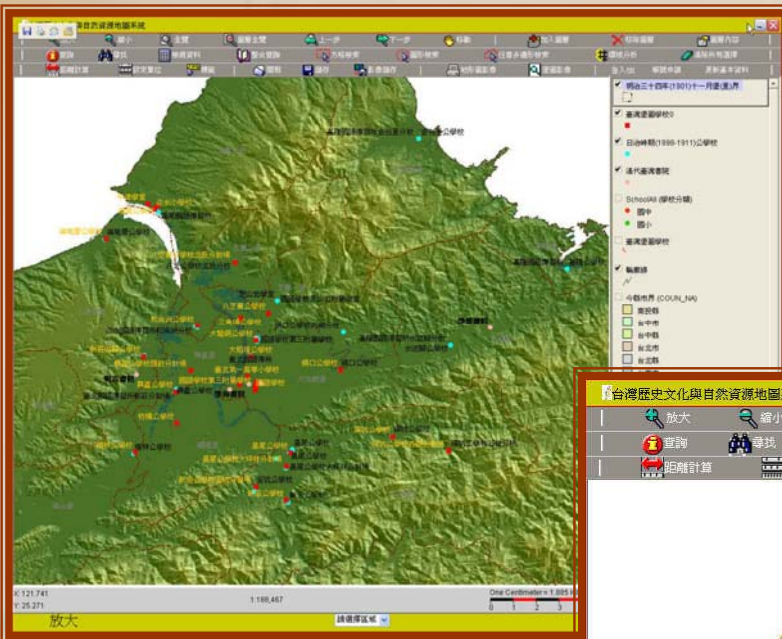


# Promote Knowledge Dissemination

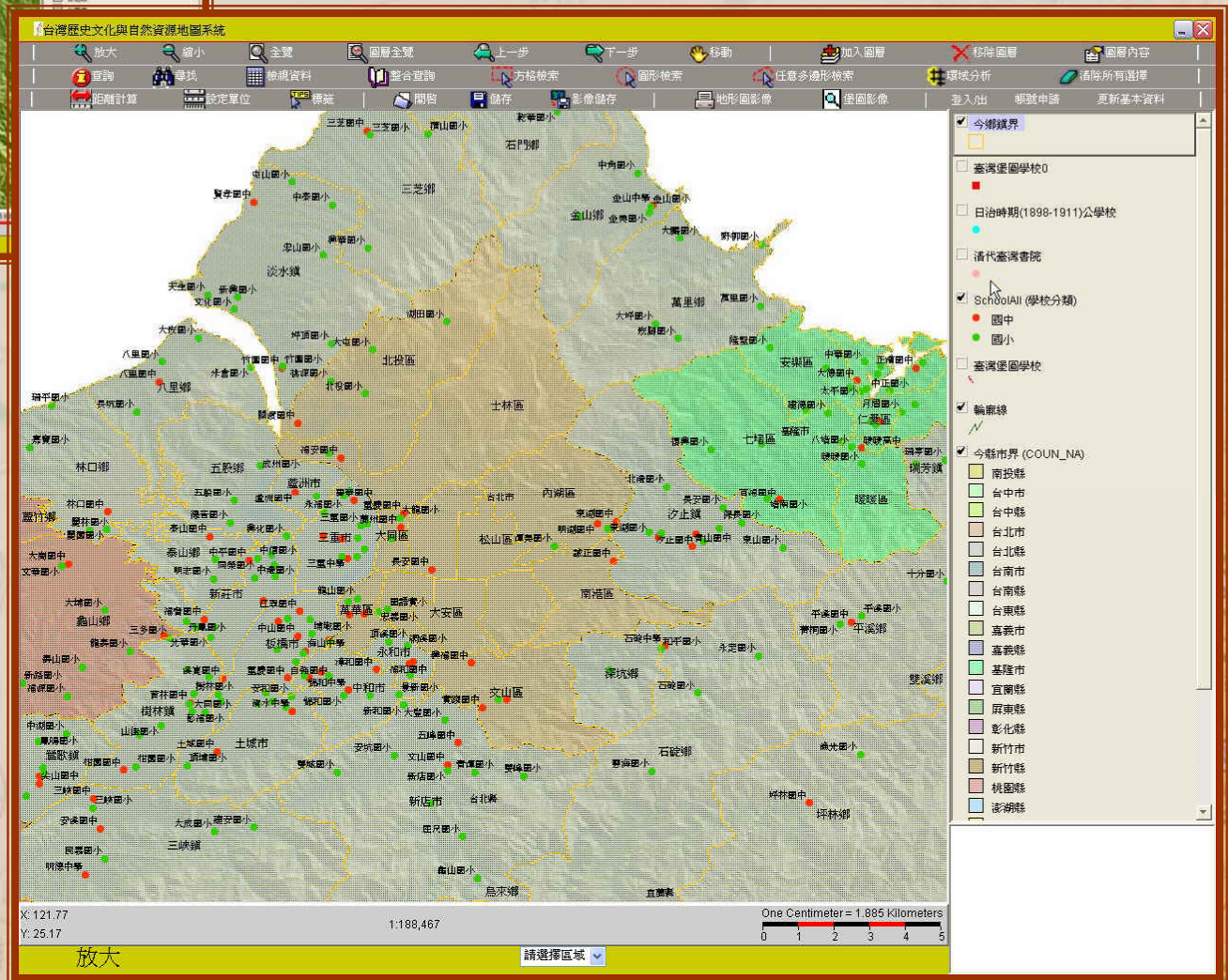
- Work for mutual communication and public participation
  - develop interactive Historical Geographic Information System
- Share resources with the public



# Current elementary and junior high schools



## Schools in Ching Dynasty and Japanese Colonial Period





# Academic Exchange

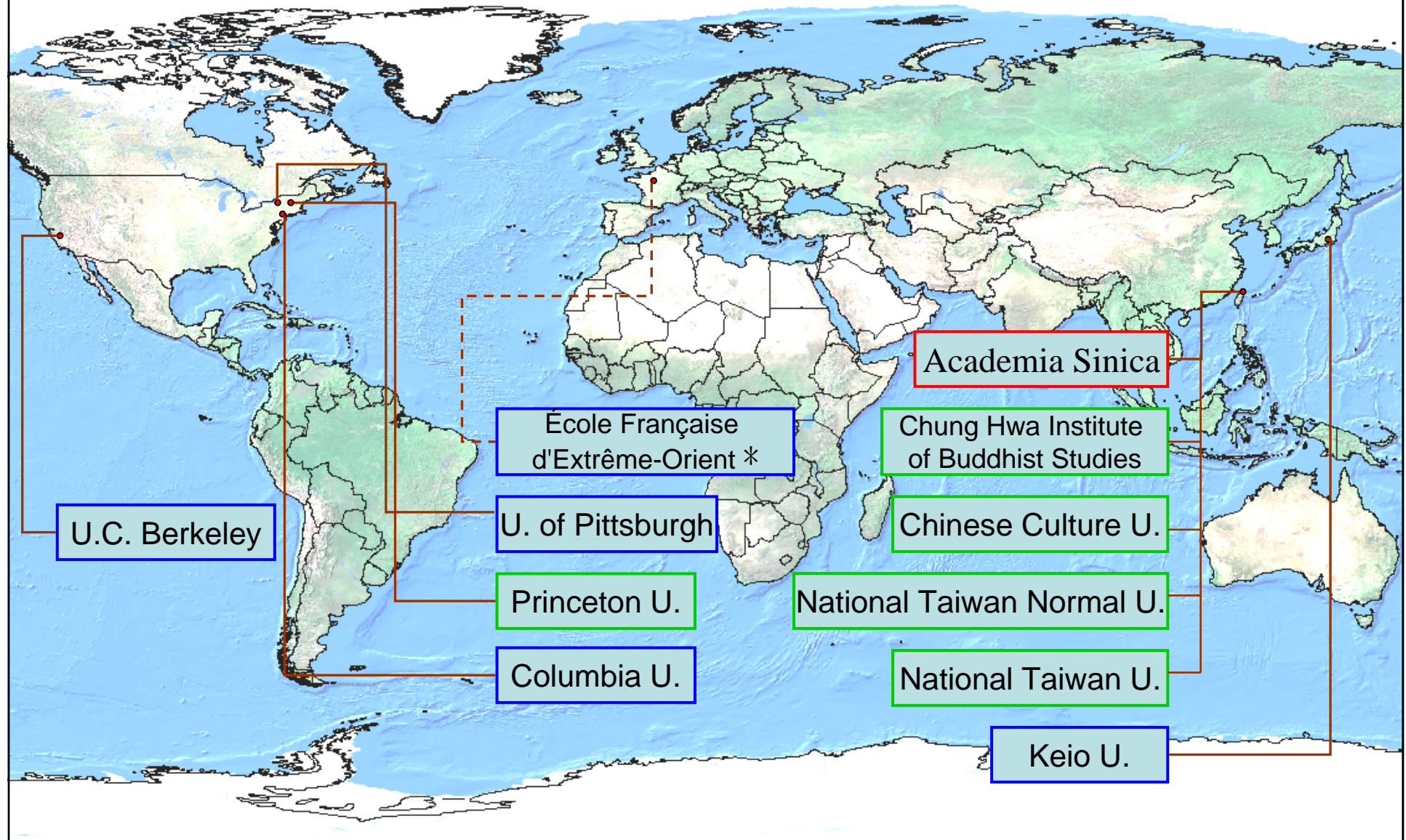
- “Chinese Civilization in Time and Space” is now accessible by many academic institutions:
  - In Taiwan : National Taiwan University, National Taiwan Normal University and The Chung Hwa Institute of Buddhist Studies
  - Overseas : Princeton University, UC Berkeley, Columbia University, University of Pittsburgh
- “Taiwan History and Culture in Time and Space” is now open to the public through internet
- Support the National Digital Archives program

**Academia Sinica Site**

**Mirror Sites**

**Authorized Sites**

\* In preparation





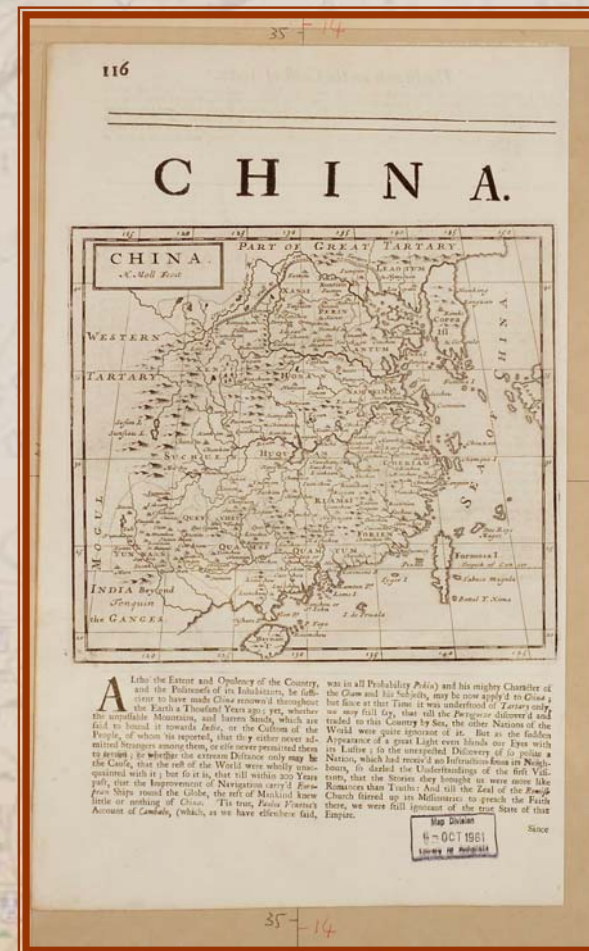
# Academic Cooperation

- Library of Congress Map Collections

Historical Map of Taiwan, 1845



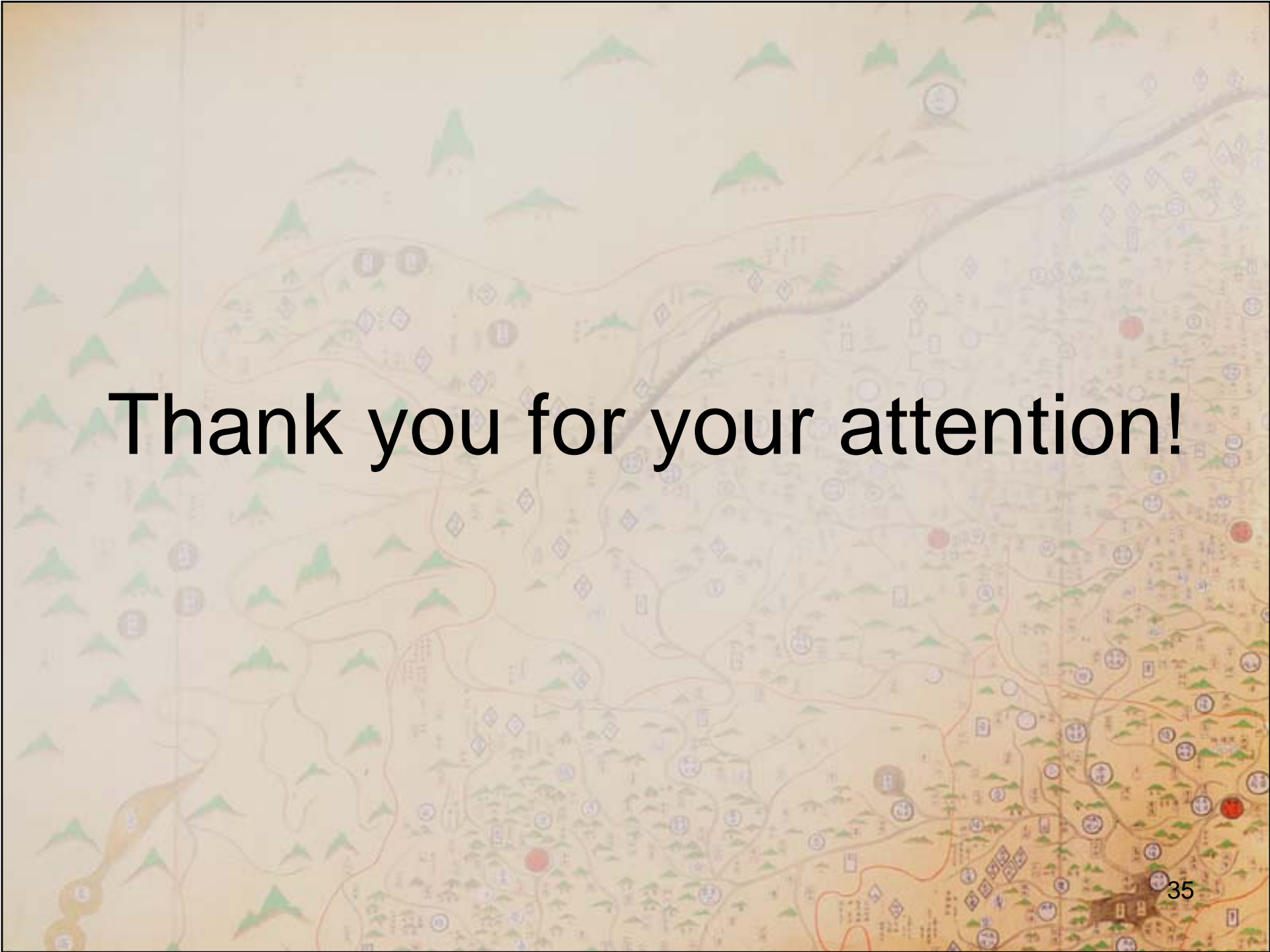
Historical Map of China, 1723



# Prospects

- Virtual Center of Sinology Studies
- Open Lab for China and Taiwan Studies
- Enhance the recognition of environment, history and culture. Promote the harmonic development between man and land.



A traditional Chinese map, likely a historical or fictional representation, featuring a light beige background. The map is populated with numerous green, triangular mountain peaks of varying sizes. A prominent, winding river or path, depicted in a light brown or tan color, flows from the upper right towards the lower left. Scattered across the map are various symbols, including small circles, squares, and diamonds, some of which are colored red, blue, or purple. These symbols likely represent different types of locations, such as cities, forts, or natural features. The overall style is characteristic of traditional Chinese cartography, with a focus on symbolic representation of the landscape.

**Thank you for your attention!**