



China Data Institute

chinadatacenter.net
China-data-online.org

Read Time in Space

Spatio-temporal Analysis with US and China Data

Shuming Bao, Ph.D.
Director, China Data Institute

Time: the Most Challenge in Spatio-temporal Analysis

Availability

Accessibility

Comparability

Case Study One

**A Spatio-temporal Analysis of Population
Landscape in China and US**

Vanishing Villages and Culture in China



vanished villages in China

All Images News Videos Shopping More Settings Tools

About 641,000 results (0.70 seconds)

China's villages vanish amid rush for the cities - Telegraph
www.telegraph.co.uk > News > World News > Asia > China
Nov 23, 2013 - Three decades of unprecedented economic and social change in **China** have killed off hundreds of thousands of rural **villages** and pushed ...

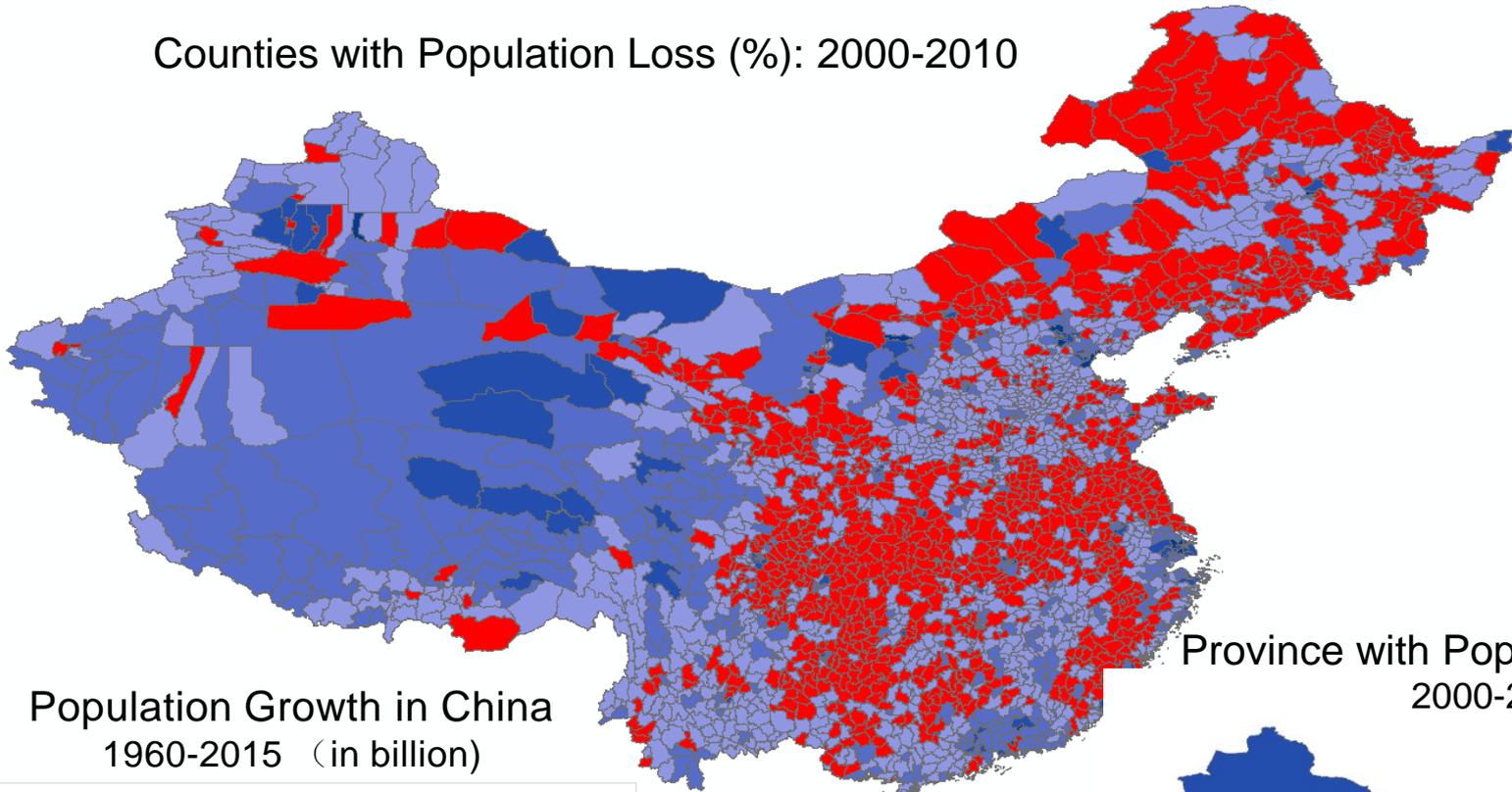
Disappearing villages: the losers in China's breakneck urbanisation
www.newstatesman.com/2015/04/fat-land
May 6, 2015 - A quarter of **China's villages** have **disappeared** since 2000, victims of outward migration or the redrawing of boundaries that absorbed them into ...

Quiet, Haunting Photos of Vanishing Villages in China's Rural ...
www.featureshoot.com/.../quiet-haunting-photos-vanishing-villages-chinas-rural-coun...
Sep 11, 2014 - In his project The Degradation of **Villages**, **Chinese** photographer Wang Yuanling gives us a glimpse into a **vanishing** world. **China's** near ...

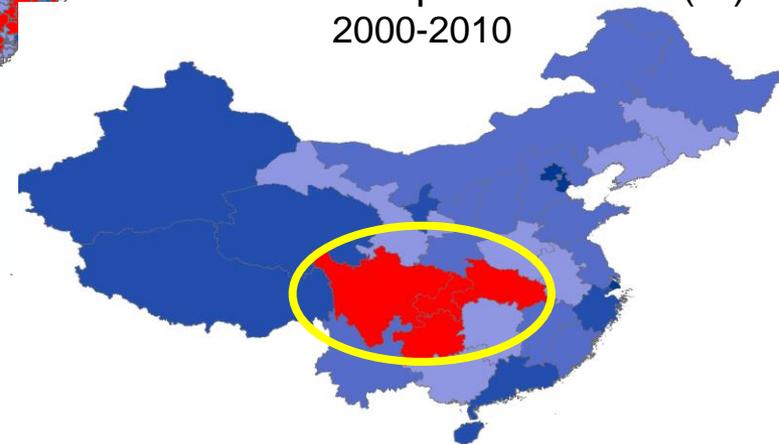
In China, 'Once the Villages Are Gone, the Culture Is Gone' - The New ...
<https://www.nytimes.com/2014/02/.../once-the-villages-are-gone-the-culture-is-gone.htm...>
Feb 1, 2014 - **Rapid urbanization in China** means **village** life, the bedrock of **Chinese** culture, is rapidly **vanishing**, and with it, traditions and history.

Counties with Population Loss (%) in China (2000-2010)

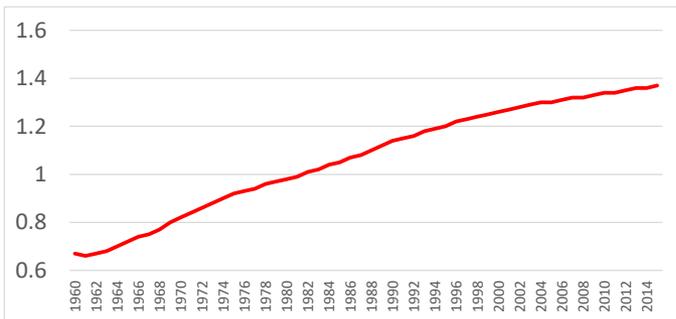
Counties with Population Loss (%): 2000-2010



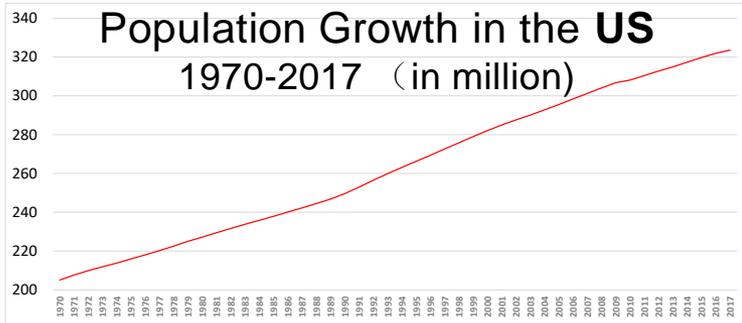
Province with Population Loss (%)
2000-2010



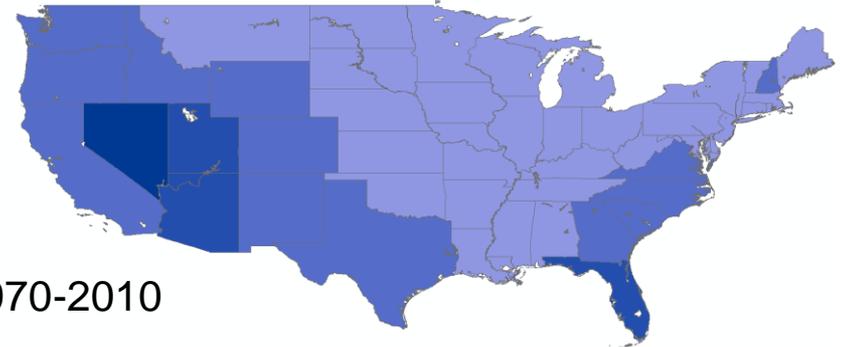
Population Growth in China
1960-2015 (in billion)



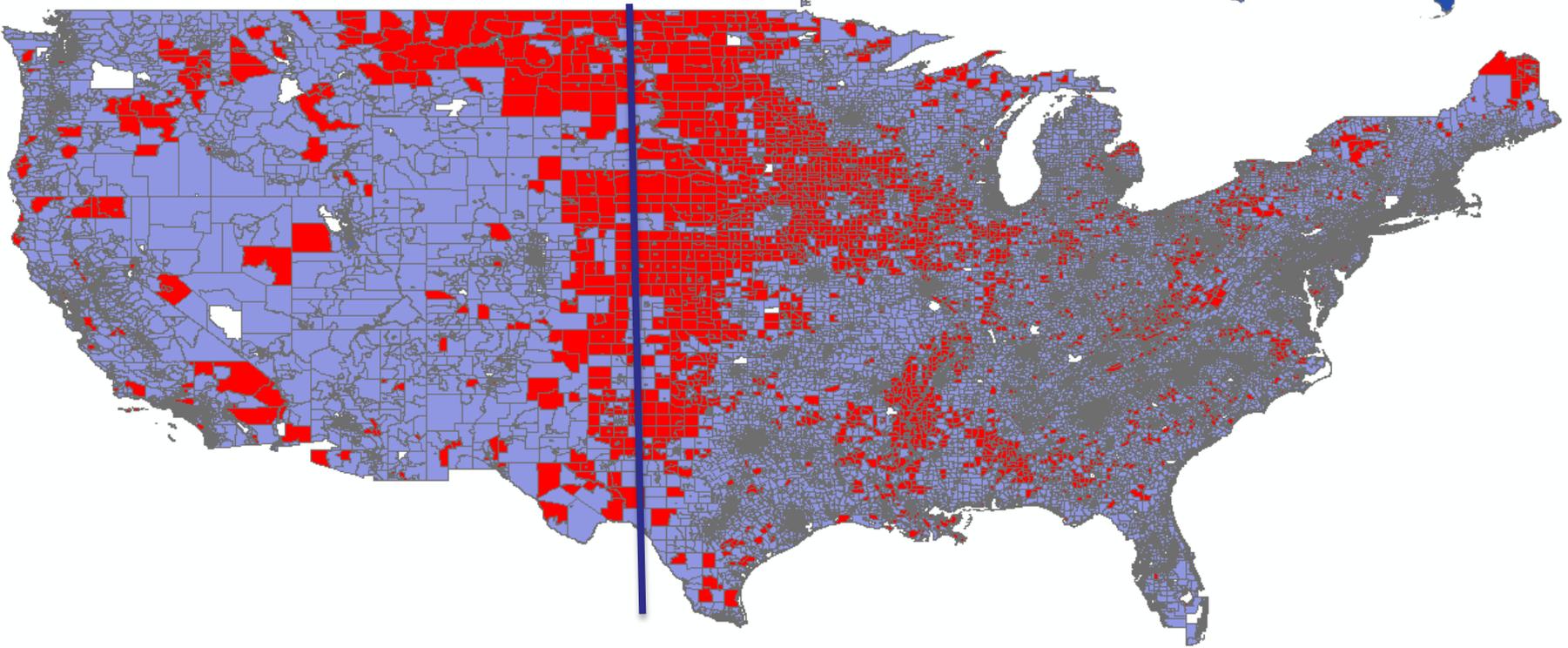
Tracts with Population Loss (%) in the US (1970-2010)



Changes in Population by **State** (%): 1970-2010

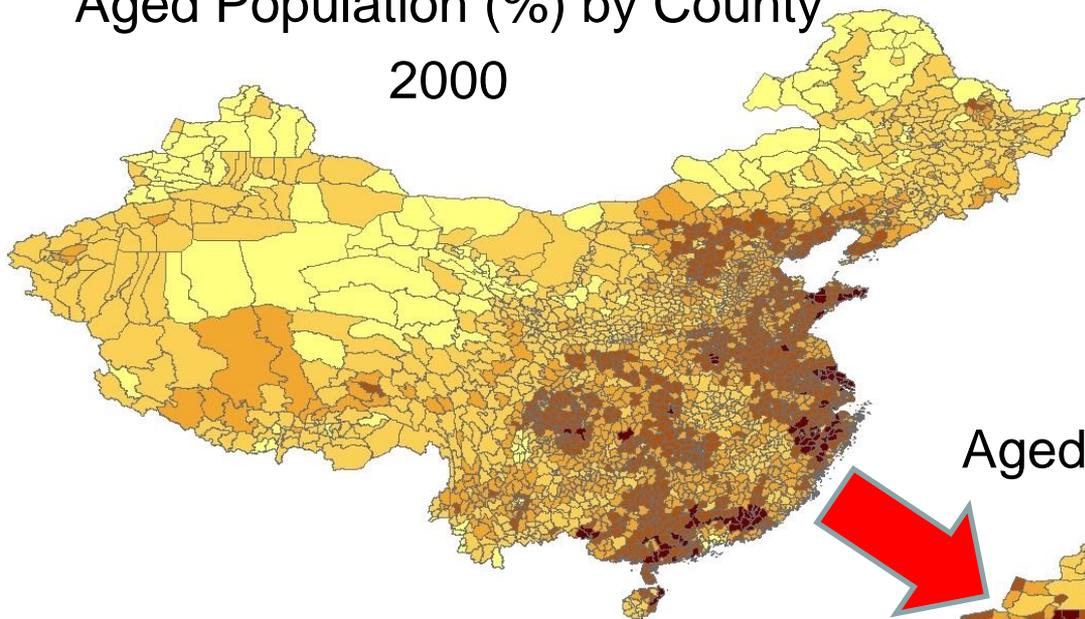


Tracts with Population Loss (%): 1970-2010

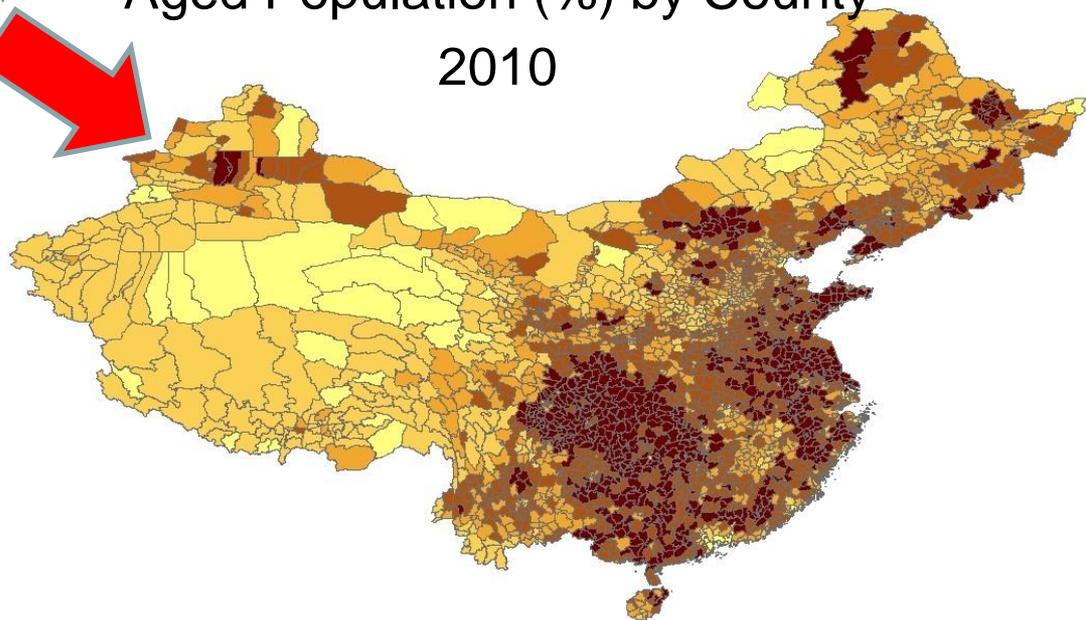


Counties with Aged Population (%) in China (2000 – 2010)

Aged Population (%) by County
2000

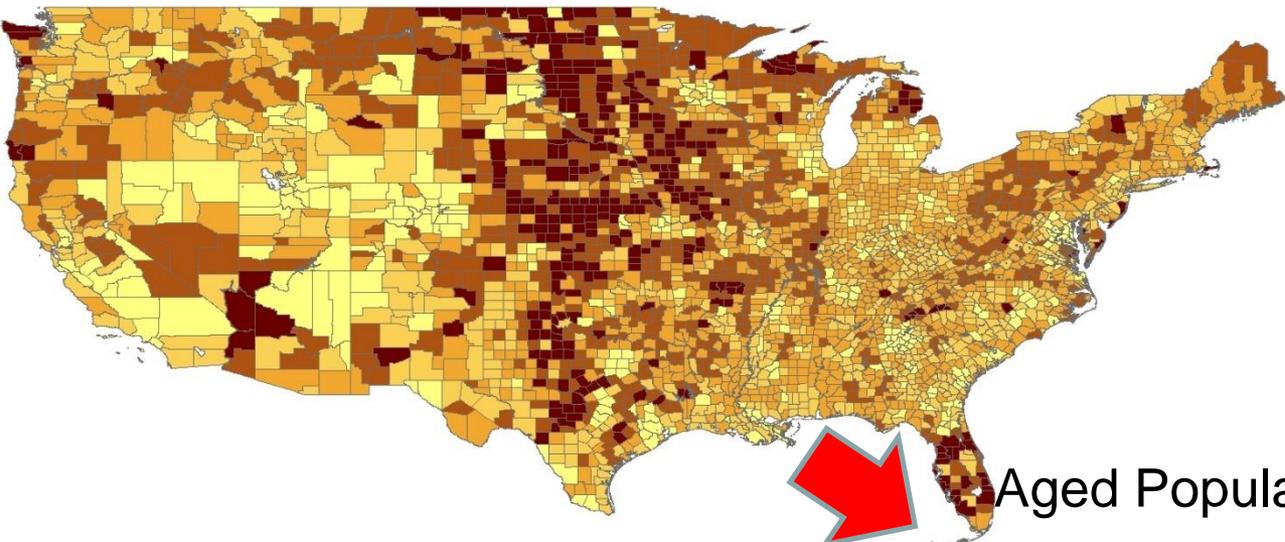


Aged Population (%) by County
2010

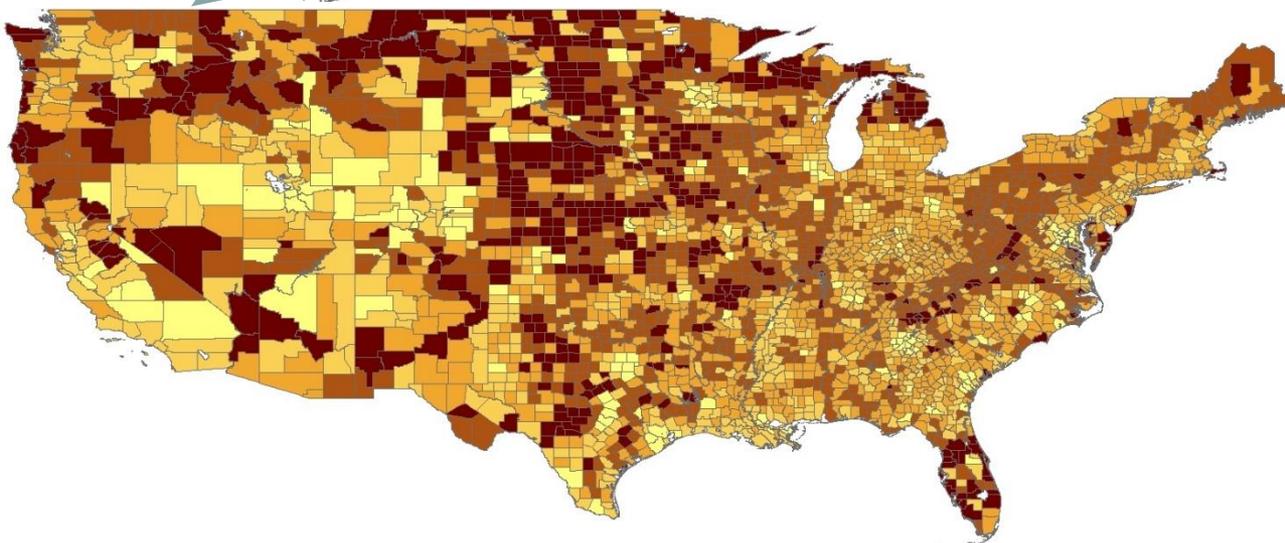


Counties with Aged Population (%) in the US (2000 – 2010)

Aged Population (%) by County in 2000



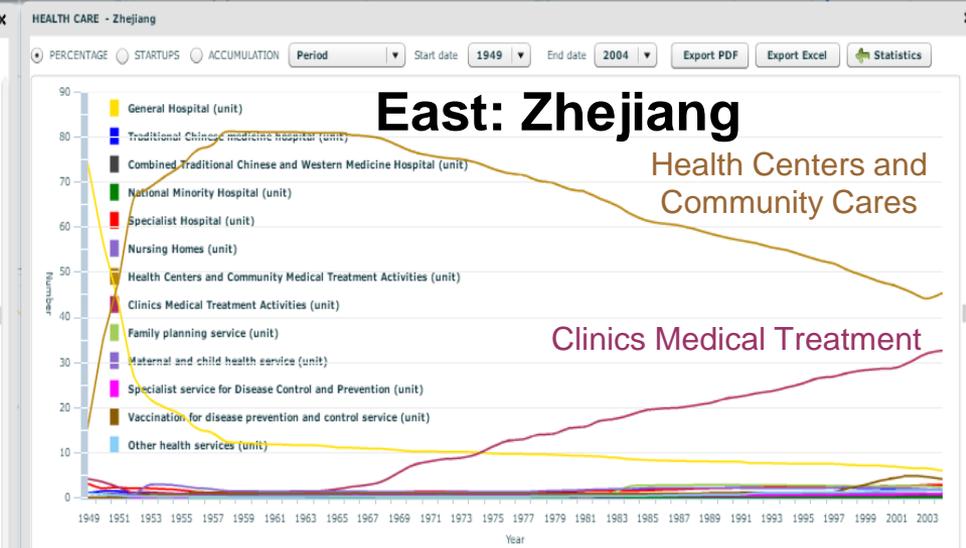
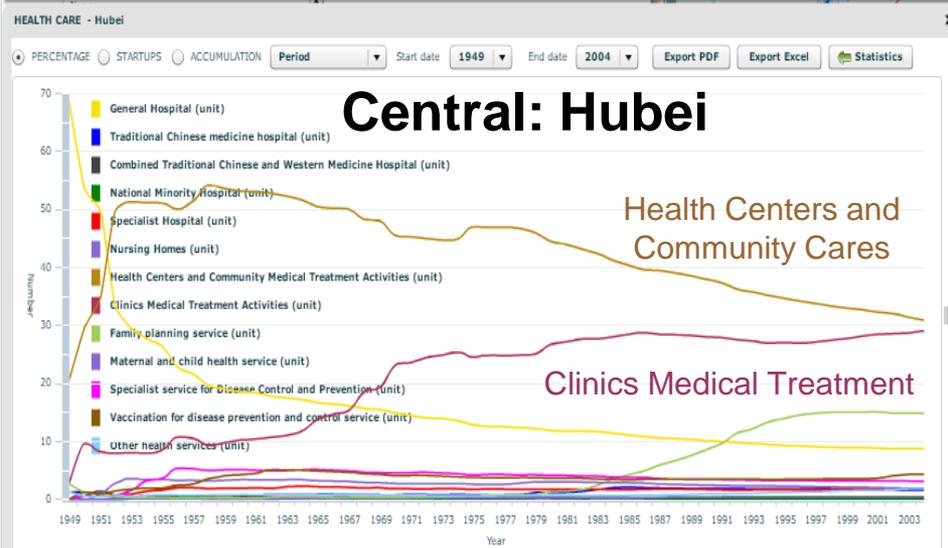
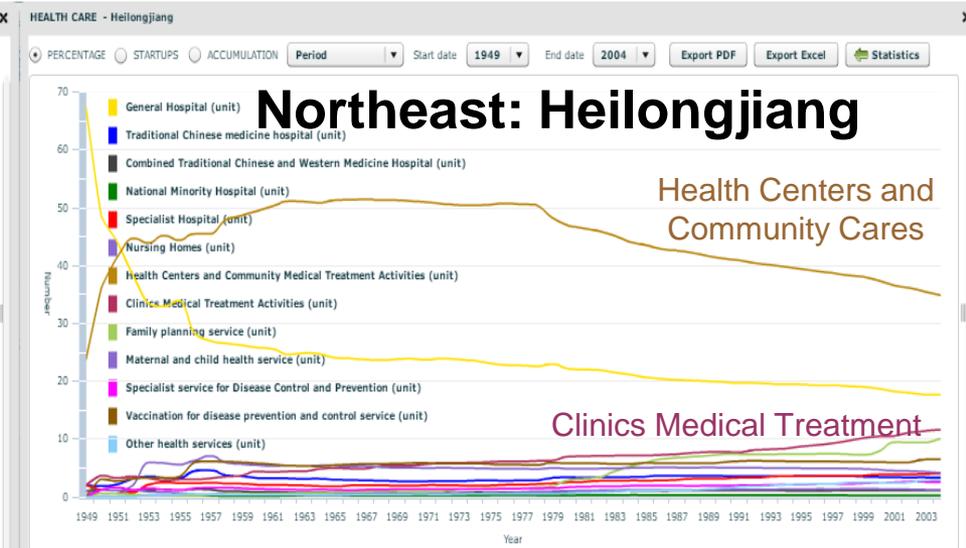
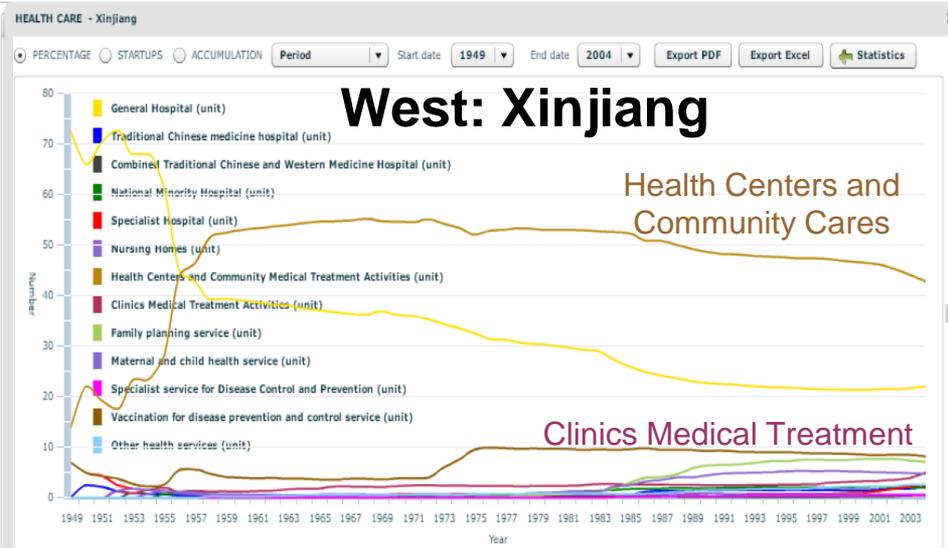
Aged Population(%) by County in 2010



Case Study Two

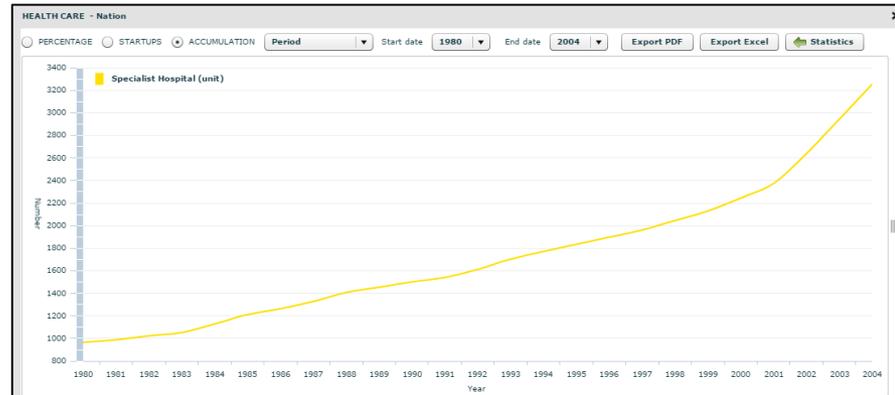
A Spatio-temporal Analysis of Health Care

Changes in Health Care by Region (1949 – 2004)



Changes in Special Hospitals (1980 – 2004)

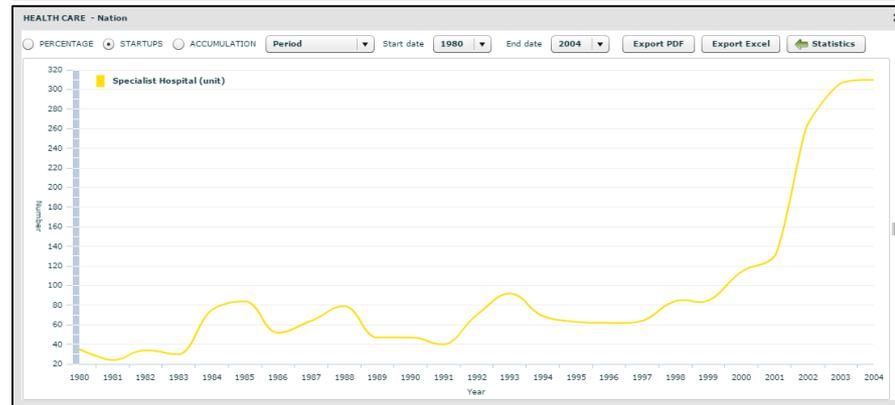
Accumulation



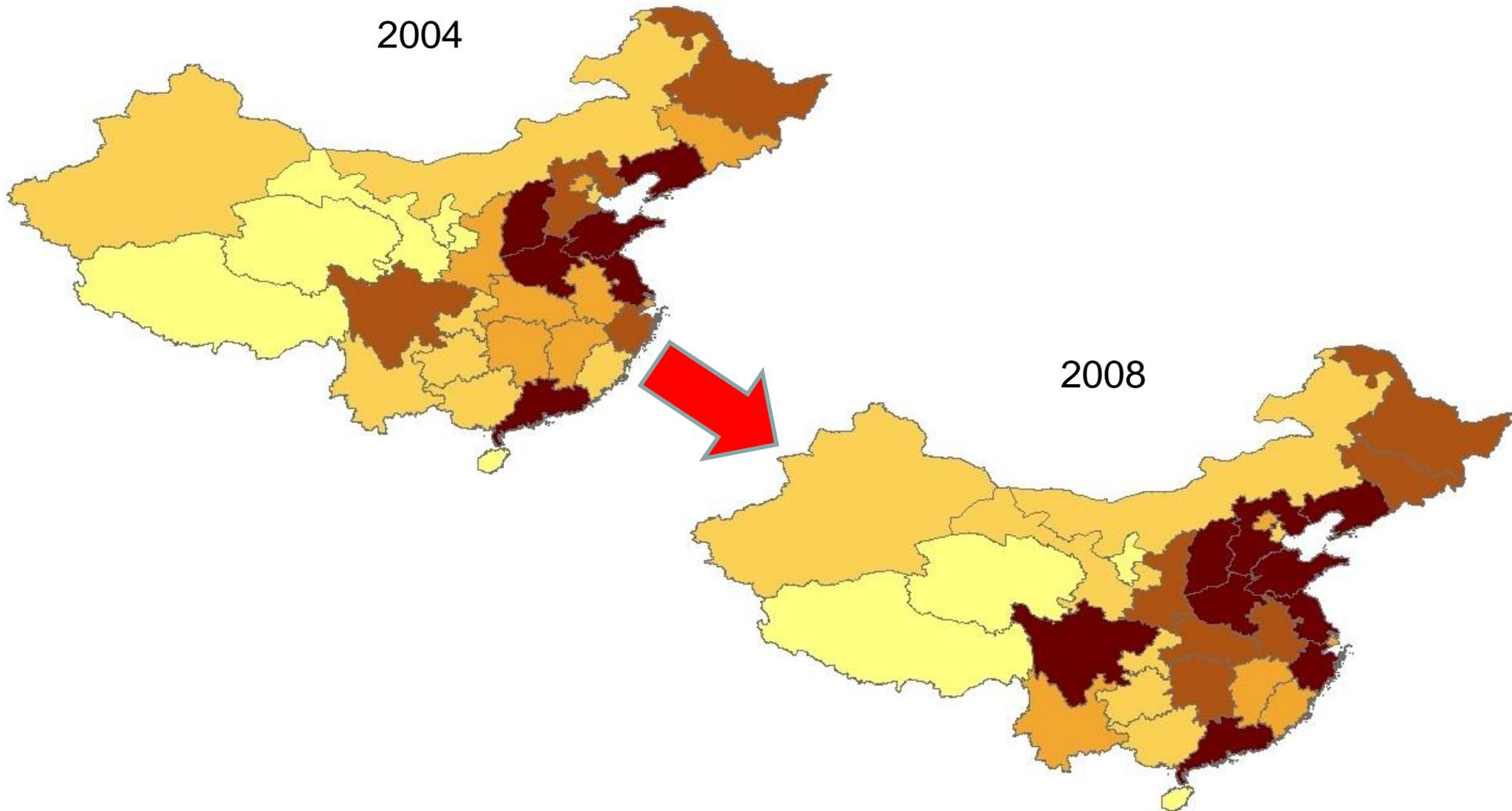
Percentage



New Start Ups



Growth of Special Hospitals in China (2004 – 2008)



An Integration of Spatial and Temporal Data:

China Geo-Explorer

US Geo-Explorer

China Geo-Explorer

chinageoexplorer.org/cge/cityclient167/#

Administrative Unit X&Y Location Chart Time Series Establishment Theme Map GIS Map Export

Welcome, UM Asia Library! 中文 English Log out

Map Export Reset

Theme map export options

Base Year: 2000 2010 2000-2010

Extent: All Regions Selected Regions

Level: Province City County Town

The theme map at this level starts displaying at zoom 1

Upload your data

Find:

Operations

Level: Province

Theme Layer List

- Urban Population
 - 508,325 to 6,018,417
 - 6,018,417 to 9,958,833
 - 9,958,833 to 12,350,296
 - 12,350,296 to 17,397,837
 - 17,397,837 to 22,356,574

Basic Layer List

- OpenStreetMap
- TianDiTu
- No BaseMap

Boundary Layer List

- Province Layer
- Prefecture Layer
- County Layer
- Township Layer

Census 2000

- General Information (Short Table: 100 percent sampling)
- 2000 population Sampling from Long Table(9.5 percent)

Economic Census 2008

Economic Census 2004

Basic Unit Census 2001

Industry Census 1995

Land Use

Nighttime lights

Theme Map Options

Classification list

No.	Color	Classification Value
1		508,325 to 6,018,417
2		6,018,417 to 9,958,833
3		9,958,833 to 12,350,296
4		12,350,296 to 17,397,837
5		17,397,837 to 22,356,574
6		22,356,574 to 47,906,715

Census 2010

Census 2000

Economic Census 2008

Economic Census 2004

Basic Unit Census 2001

Industry Census 1995

Land Use

Nighttime lights

© OpenStreetMap contributors

US Geo-Explorer

usgeoexplorer.org/uge/ugeclient43/#app=b79d&b7c8-selectedIndex=1

Administrative Unit X&Y Location Chart Time Series Establishment Theme Map GIS Map Export

Group: Single group Multi-groups

Level: State County Tract Block
 Metropolitan CCD Place Any area

Region Customized Report Standard Report

Output: 19 index selected

Report type: Summary Compare Original

Find:

- 76: Miscellaneous Repair Services
- 78: Motion Pictures
- 79: Amusement And Recreation Services
- 80: Health Services
 - 8011: OFFICES AND CLINICS OF MEDICAL DOCTORS_2013
 - 8021: OFFICES AND CLINICS OF DENTISTS_2013
 - 8031: OFFICES AND CLINICS OF OSTEOPATHIC PHYSICIANS_2013
 - 8041: OFFICES AND CLINICS OF CHIROPRACTORS_2013
 - 8042: OFFICES AND CLINICS OF OPTOMETRISTS_2013
 - 8043: OFFICES AND CLINICS OF PODIATRISTS_2013
 - 8049: OFFICES OF HEALTH PRACTITIONER_2013
 - 8051: SKILLED NURSING CARE FACILITIES_2013
 - 8052: INTERMEDIATE CARE FACILITIES_2013
 - 8059: NURSING AND PERSONAL CARE, NEC_2013
 - 8062: GENERAL MEDICAL AND SURGICAL HOSPITALS_2013
 - 8063: PSYCHIATRIC HOSPITALS_2013
 - 8069: SPECIALTY HOSPITALS, EXCEPT PSYCHIATRIC_2013
 - 8071: MEDICAL LABORATORIES_2013
 - 8072: DENTAL LABORATORIES_2013
 - 8082: HOME HEALTH CARE SERVICES_2013
 - 8092: KIDNEY DIALYSIS CENTERS_2013
 - 8093: SPECIALTY OUTPATIENT CLINICS, NEC_2013
 - 8099: HEALTH AND ALLIED SERVICES, NEC_2013
- 81: Legal Services
- 82: Educational Services
- 83: Social Services
- 84: Museums, Art Galleries, And Botanical And Zoological Gardens
- 86: Membership Organizations
- 87: Engineering, Accounting, Research, Management, And Related Services

Operations

Level: CCD

Theme Layer List

Basic Layer List

- Open Street Map

Reference Layer

- State
- County
- Tract

Presidential Election Data

Census Data 1970-2010

- Census 2010
- Census 2000
- Census 1990
- Census 1980
- Census 1970

Economics Census 1986-2012

Business Data 1997-2013

- Firm Level Total 2013
- Firm Level Total 2012
- Firm Level Total 2011
- Firm Level Total 2010
- Firm Level Total 2009
- Firm Level Total 2008
- Firm Level Total 2007
- Firm Level Total 2006
- Firm Level Total 2005
- Firm Level Total 2004
- Firm Level Total 2003

Primary Functions

Data Selection

- By administrative units (province, city, county, township)
- By groups
- By location (X&Y) and spatial range (km or miles)
- By time-series statistics (province, city and county)
- By establishments (province, city, county and ZIP)

Reporting

- Summary report
- Comparison report
- Original data report

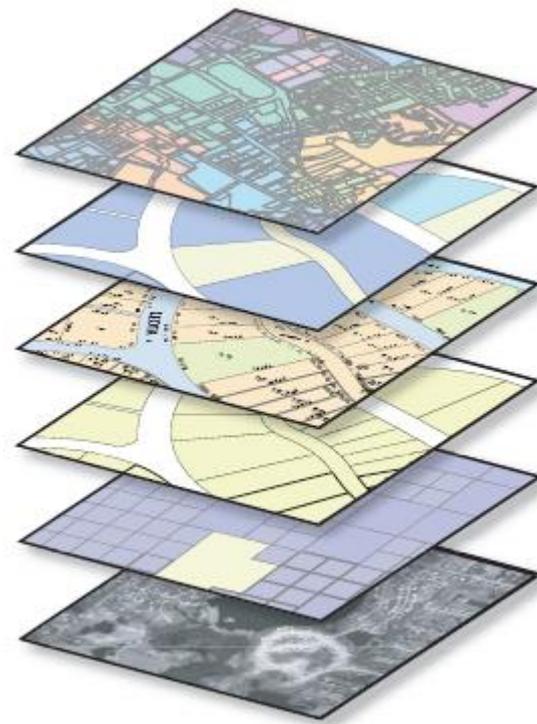
Export

- Data tables (Excel)
- Reports (Excel, Word, PDF)
- GIS maps (Shape)
- Maps (PDF)

Map Library with Metadata

- Pre-defined maps
- Easy links between maps of different spatial levels
- Easy links to related industries

Availability



Available Time Data in CGE



- **Government Statistics**
 - Provincial Statistics (1949-)
 - City Statistics (1996-)
 - County Statistics (1997-)

- **Population Census**
 - Census 1953
 - Census 1964
 - Census 1982
 - Census 1990
 - Census 2000
 - Census 2010

- **Economic Census**
 - Industrial Census 1995
 - Basic Unit Census 2001
 - Economic Census 2004 & 2008

- **Business Data at Firm Level** (> 7 million records)
 - Year of establishment

- **Remote Sensed Data**
 - Land Use data (1990, 1995, 2000, 2005, 2010)
 - Yearly night-time light data (1992-)

Base Year: 2000 2010 2000-2010

Group: Single group Multi-groups

Level: Province City County Town

Region Customized Report Standard Report

Find: **Census & RS**

- Census 2000
- Economic Census 2008
- Economic Census 2004
- Basic Unit Census 2001
- Industry Census 1995
- Land Use
- Nighttime lights

Business

Responsible person: 苏青林

Type: Automobile Zheng Che Manufacturing Production

ZIP: 230031

Address: Anhui Hefei Shu Shan Qu You Dun Cun

Telephone: 0551-584234

Ownership: Other Limited

Starting year: 1997

Revenue: 1000-3000

Employee Count: 100-499

Google Baidu Wanfang Data

Go to Location Selection Close

Region Year Customized Report

Find: **Statistics**

- ▶ GROSS DOMESTIC PRODUCTS
- ▶ INDICES OF GROSS DOMESTIC PRODUCTS (preceding year=100)
- ▶ GROSS DOMESTIC PRODUCTS BY EXPENDITURE APPROACH
- ▶ POPULATION
- ▶ EMPLOYMENT, STAFF AND WORKERS
- ▶ TOTAL INVESTMENT IN FIXED ASSETS
- ▶ FLOOR SPACE OF BUILDINGS AND REAL ESTATE DEVELOPMENT
- ▶ OVERALL PRICE INDICES
- ▶ Urban Households Per Capital Annual /Disposable Income/Total(yuan)
- ▶ REVENUE AND EXPENDITURE
- ▶ DEPOSITS AND LOANS OF FINANCIAL INSTITUTIONS
- ▶ BASIC STATISTICS FOR AGRICULTURE
- ▶ GROSS OUTPUT VALUE AND INDICES OF FARMING, FORESTRY, ANIMAL HUSBANDRY
- ▶ PRODUCTION CONDITION FOR AGRICULTURE

Available Time Data in UGE



- **Presidential Election** (1984-2016)

- **Population Census**

- Census 1970
- Census 1980
- Census 1990
- Census 2000
- Census 2010

- **Economic Census** (1986-)

- **Business Data** (1997-)

- **Business Records at Firm Level** (> 13 million records)

- Year recorded

Level: State County Tract Block
 Metropolitan CCD Place Any area

Region Customized Report Standard Report

Find: 🔍 ⏪ ⏩

- Presidential Election Data
- Census Data 1970-2010
- Economics Census 1986-2012
- Business Data 1997-2013

Detailed Information

Property	Info
Address	PO BOX 18084
Co.Name	ALABAMA FIBROMYALGIA CTR
Contact	REGINA MC CLAIN
Employee Count	9
Employee Size	9
Fax	
Location	-86.586427 : 34.700901
Phone	2564288232
SIC Code	809974
SIC Description	SLEEP DISORDERS-DIAGNOSTIC/TRE
Sales Volume	1791
Starting Year	2009
State	AL
Type	OFFICES OF PHYSICIANS EXCEPT ME
Zip Code	35804

Administrative Units => Report

Administrative Unit X&Y Location Chart Time Series Establishment Theme Map GIS Map Export China-US Comparison Map Library Welcome, UM Asia Library! 中文 English Log out

Base Year: 2000 2010 2000-2010
 Group: Single group Multi-groups
 Level: Province City County Town Any area

Region Customized Report Standard Report Upload your data
 HTML PDF CSV Excel RTF ODT

6 index selected
 Report type Summary Report Compare Report Original Report
 Find:

- Census 2000
- Economic Census 2008
- Economic Census 2004
- Basic Unit Census 2001
- Industry Census 1995
- Land Use
- Nighttime lights

Operations Level: Province

Theme Layer List
 Basic Layer List
 Boundary Layer List

temp_report (43).xls [Compatibility Mode] - Excel

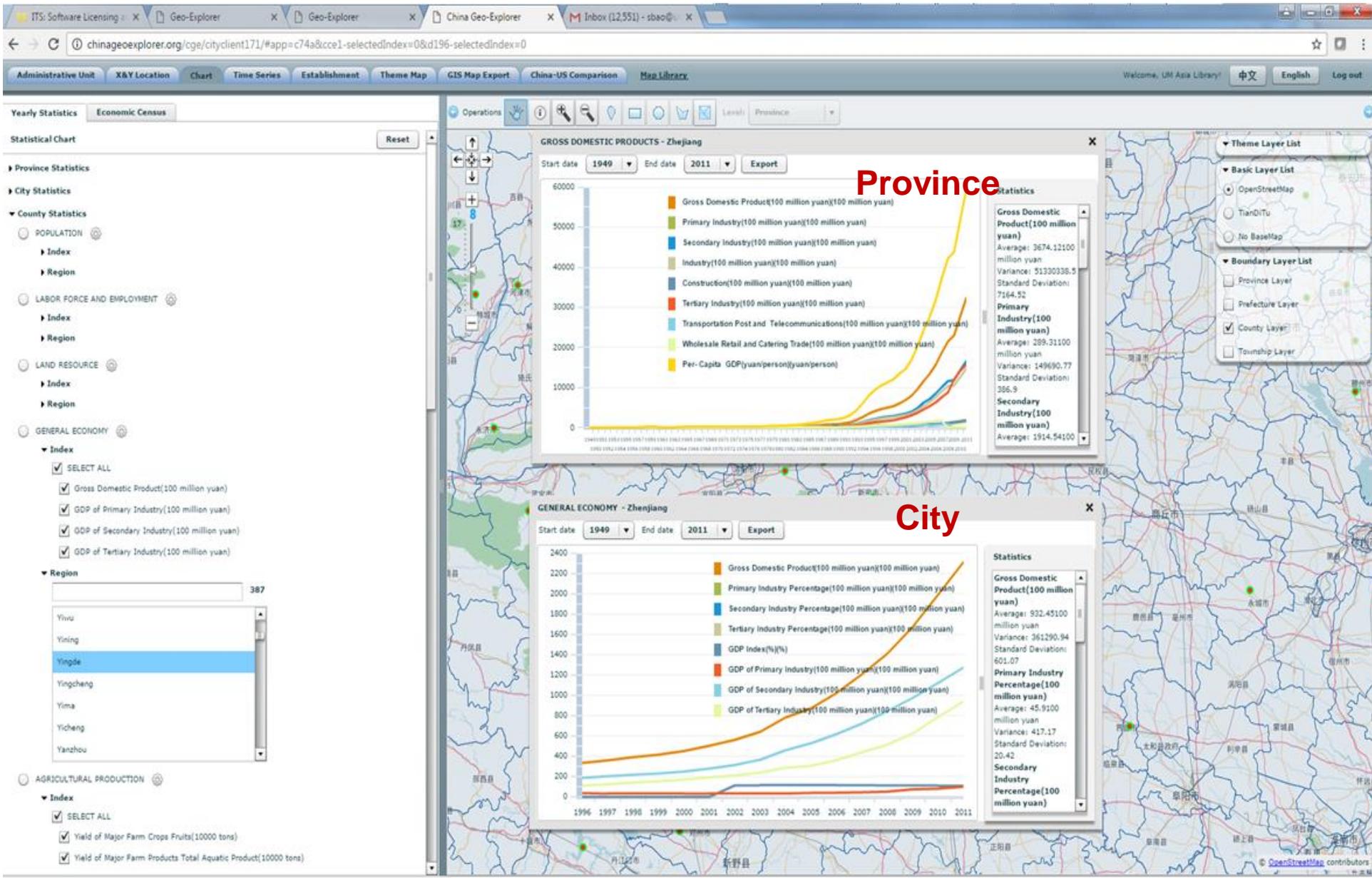
2000 Total Population
 2000 Urban Population
 2000 Rural Population
 2008 Number of All Units
 2004 Number of All Units
 2001 Total Industrial Units

	Anhui	Beijing	Chongqing	Fujian	Gansu	Guangdong	Guangxi
2000 Total Population	58,999,948	13,569,194	30,512,763	34,097,947	25,124,282	85,225,007	43,854,538
2000 Urban Population	15,766,389	10,522,464	10,095,512	14,306,812	6,018,417	47,432,392	12,350,296
2000 Rural Population	43,233,559	3,046,730	20,417,251	19,791,135	19,105,865	37,792,615	31,504,242
2008 Number of All Units	204,959	267,757	139,006	232,466	94,260	617,717	154,443
2004 Number of All Units	230,706	262,847	137,536	226,827	135,138	567,862	194,852
2001 Total Industrial Units	177,879	245,599	89,639	155,771	82,817	400,227	121,763

report name

READY 100%

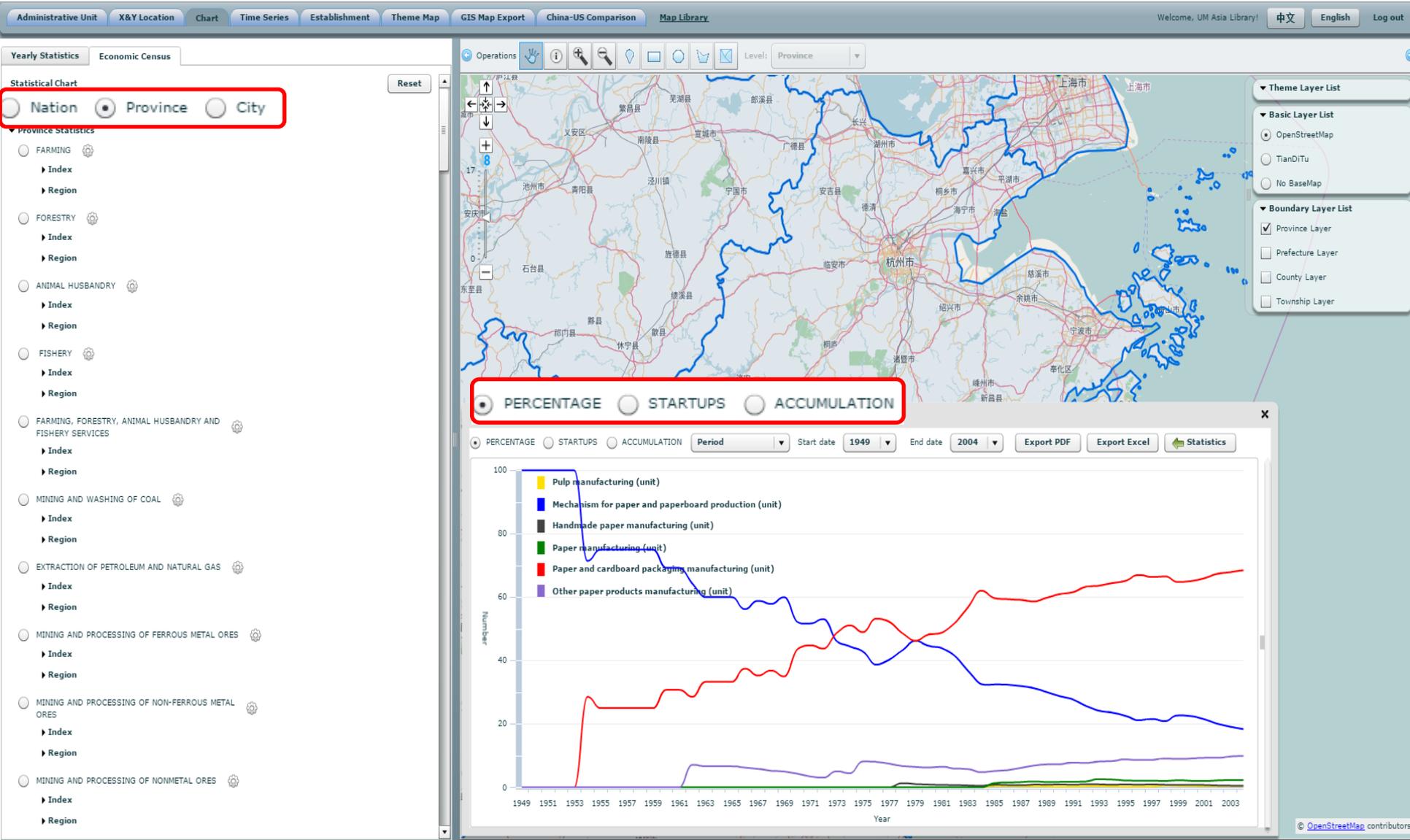
Chart => Yearly Statistics



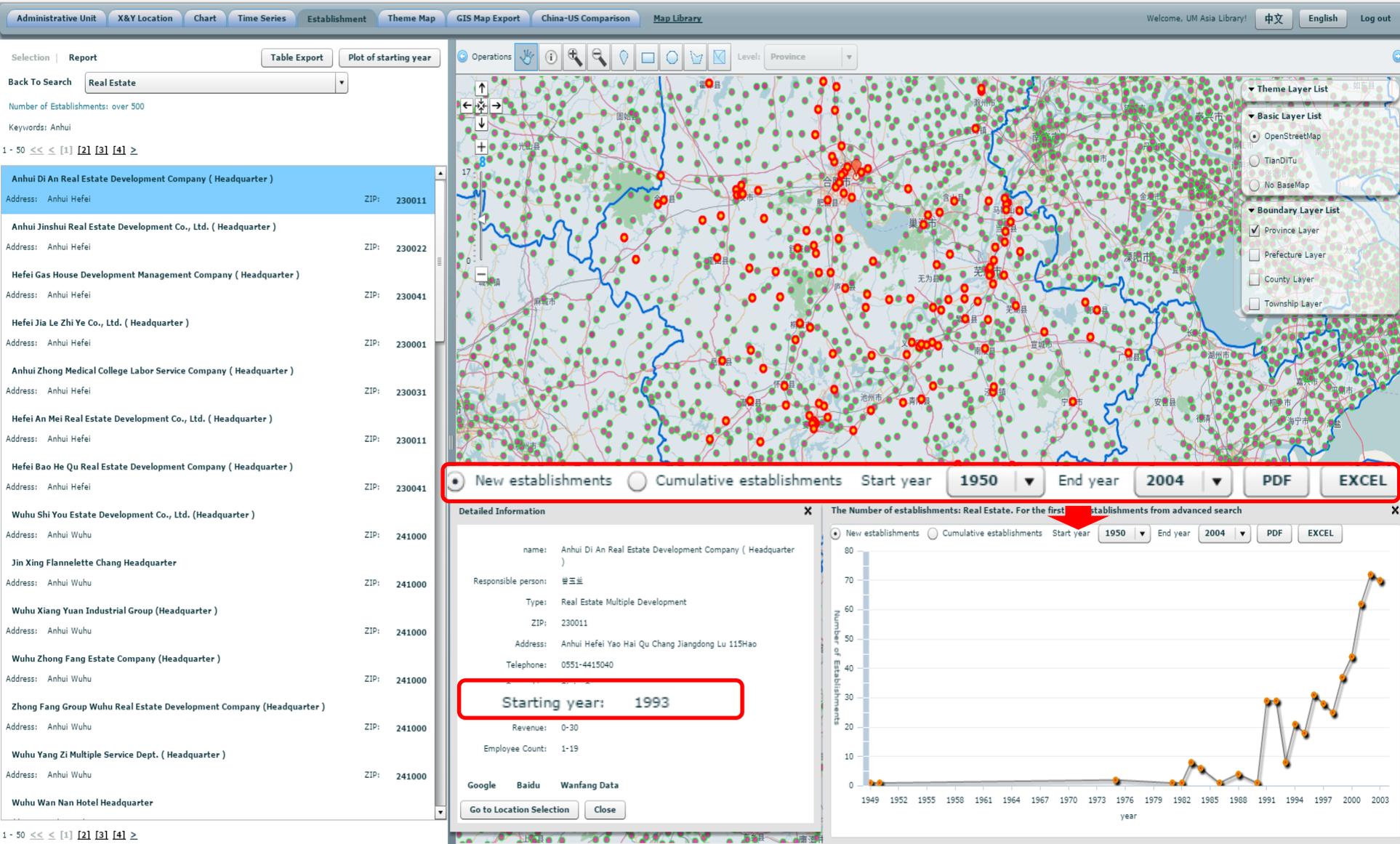
Accessibility



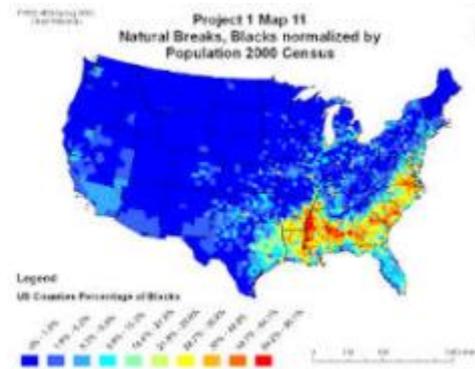
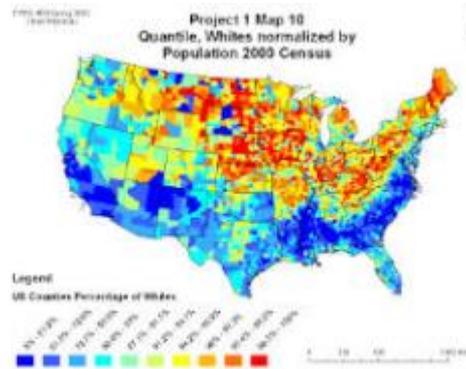
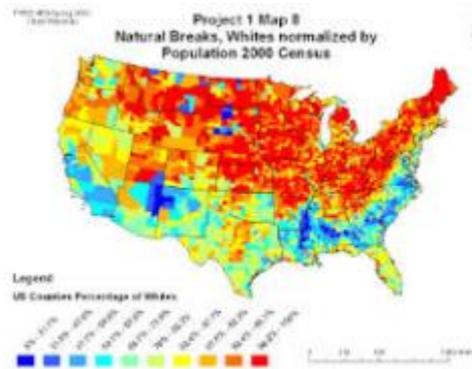
Charts => Economics Census



Establishment



Comparability



Base Maps

CHINA



Base Year: 2000 2010 2000-2010

Province

Prefecture

County

Township

Any Area

US



State

Metropolitan

County

CCD

Place

Tract

Block

Any Area

X & Y Location

Administrative Unit X&Y Location Chart Time Series Establishment Theme Map GIS Map Export China-US Comparison Map Library Welcome, UM Asia Library! 中文 English Log out

Location Customized Report Standard Report

Spatial Range 1,3,5 Units miles kilometers

Label coord1

1 Lat:30.658 Lon:117.481
2 Lat:30.692 Lon:118.413
3 Lat:30.942 Lon:117.813

Lat 28.68

Lon 115.89

Add Edit Delete clear Upload

Select a layer:

None Province City County Town Zip point

- Census 2000
- Census 2010
- Economic Census 2008
- Economic Census 2004
- Basic Unit Census 2001
- Industry Census 1995
- Historic Census
- Land Use
- Nighttime lights

Operations Level: Province

Theme Layer List

Basic Layer List

- OpenStreetMap
- TianDiTu
- No BaseMap

Boundary Layer List

- Province Layer
- Prefecture Layer
- County Layer
- Township Layer

temp_report (44).xls [Compatibility Mode] - Excel

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW

Normal Page Break Page Custom Workbook Views Preview Layout Views

Ruler Formula Bar Gridlines Headings

Zoom 100% Zoom to Selection

New Arrange Freeze Window All Panes - Unhide

View Side by Side Synchronous Scrolling Reset Window Position

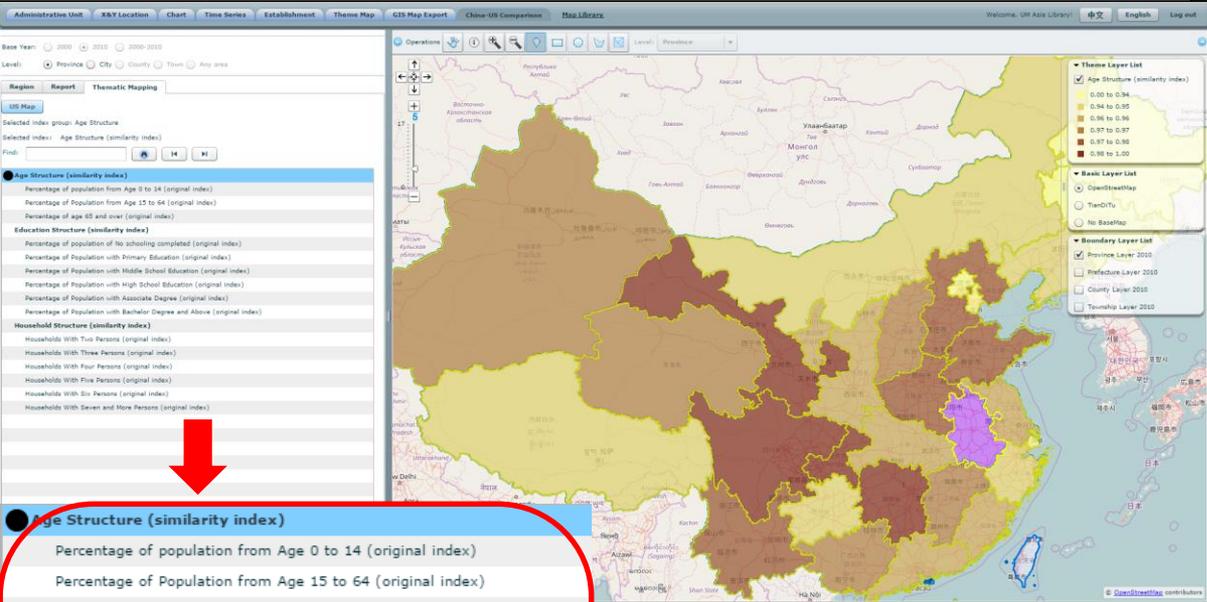
Switch Windows Macros

Date: 10/05/2017

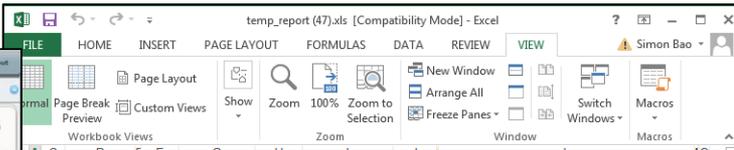
Selection: (3 places selected) 1(lat: 30.66 lon:117.48), 2(lat: 30.69 lon:118.41), 3(lat: 30.94 lon:117.81)

	1(1mile)		1(3mile)		1(5mile)		2(1mile)		2(3mile)		2(5mile)		3(1mile)		3(3mile)		3(5mile)	
	Count	Percent																
Total Households	10,138	100.0 %	28,607	100.0 %	36,184	100.0 %	3,028	100.0 %	15,875	100.0 %	26,695	100.0 %	7,858	100.0 %	78,632	100.0 %	108,056	100.0 %
Family Households	9,567	94.4 %	27,338	95.6 %	34,895	96.4 %	2,965	97.9 %	15,577	98.1 %	26,278	98.4 %	7,599	96.7 %	75,882	96.5 %	104,592	96.8 %
Collective Households	571	5.6 %	1,269	4.4 %	1,289	3.6 %	63	2.1 %	298	1.9 %	416	1.6 %	259	3.3 %	2,749	3.5 %	3,464	3.2 %
Total Population	32,165	100.0 %	91,631	100.0 %	116,927	100.0 %	9,032	100.0 %	47,822	100.0 %	81,098	100.0 %	23,920	100.0 %	240,247	100.0 %	331,988	100.0 %
Agricultural Population	7,976	24.8 %	37,043	40.4 %	61,278	52.4 %	3,740	41.4 %	24,657	51.6 %	48,581	59.9 %	4,879	20.4 %	44,347	18.5 %	93,164	28.1 %
Non-Agricultural Population	24,188	75.2 %	54,587	59.6 %	55,648	47.6 %	5,291	58.6 %	23,164	48.4 %	32,516	40.1 %	19,041	79.6 %	195,900	81.5 %	238,823	71.9 %
Population in Family Households	28,410	87.8 %	83,413	90.6 %	108,732	92.5 %	8,693	95.2 %	46,174	95.7 %	78,859	96.5 %	22,601	94.2 %	227,616	94.3 %	317,608	95.2 %

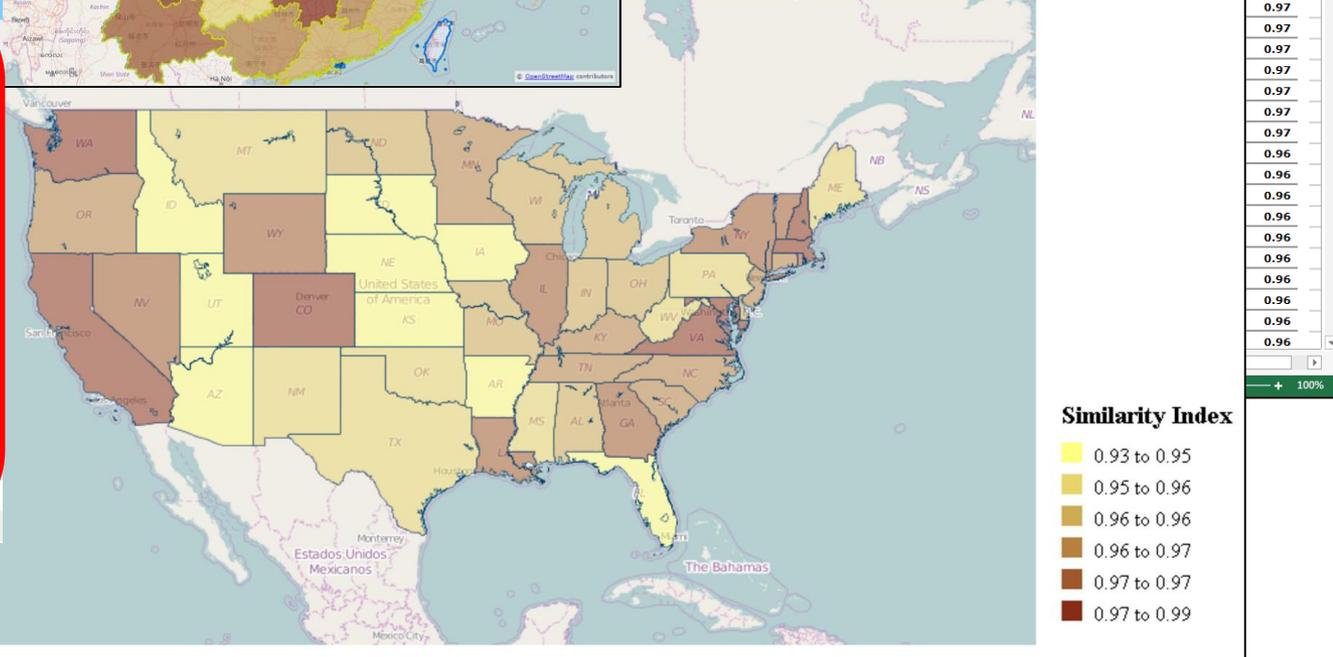
China-US Comparison



- Age Structure (similarity index)**
 - Percentage of population from Age 0 to 14 (original index)
 - Percentage of Population from Age 15 to 64 (original index)
 - Percentage of age 65 and over (original index)
- Education Structure (similarity index)**
 - Percentage of population of No schooling completed (original index)
 - Percentage of Population with Primary Education (original index)
 - Percentage of Population with Middle School Education (original index)
 - Percentage of Population with High School Education (original index)
 - Percentage of Population with Associate Degree (original index)
 - Percentage of Population with Bachelor Degree and Above (original index)
- Household Structure (similarity index)**
 - Households With Two Persons (original index)
 - Households With Three Persons (original index)
 - Households With Four Persons (original index)
 - Households With Five Persons (original index)
 - Households With Six Persons (original index)
 - Households With Seven and More Persons (original index)



name	ID	Age Structure
1 Virginia	51	0.98
2 Colorado	08	0.98
3 Maryland	24	0.98
4 New Hampshire	33	0.97
5 Washington	53	0.97
6 District of Columbia	11	0.97
7 California	06	0.97
8 Massachusetts	25	0.97
9 New York	36	0.97
10 Alaska	02	0.97
11 Georgia	13	0.97
12 Vermont	50	0.97
13 Nevada	32	0.97
14 Wyoming	56	0.97



<http://china-data-online.com>

Contact

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