AIM Interim Report
(2002-2003)

March, 2003

China Project Team of AIM/IMPACT Model

Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences (CAS)

P.O.Box 9717, Beijing 100101,China

Telephone: 86-10-64858321 Telex: 86-10-64889266,64850917

Interim Report for fiscal year 2003

By

IGSNRR Team (March 12th, 2003)

Work Done

1. Database establishing

1.1.1 Database regarding AIM/Water for some hundred cities in china, at city level, from 1991-2000, yearly

1.1.2 Water regarding dataset at province level AND RIVER BASIN LEVEL for year 2001

1.1.3 Environment regarding data at national, provincial and major cities **level for year 2000 and 2001, yearly**

Work Done

11.4 Acid rain observation data of 87 stations (Annual average, Monthly average and Daily average of observation value) for year 2000 and 2001

1.1.5 Average temperature dataset at 1 square kilometer level of China

1.1.6 Administrative district regarding dataset

1.1.7 Other Data Collection

Work Done

2. Research on 1 square kilometer level Data developing

3. Other Research

Relationships of Energy Consumption to Economy and Climate and Their Changes in China

Work Plan

1. Work dedicated by AIM team

2. Research on spatialization of observed data and socio-economic

3. 1 square kilometer level data developing

4. Further work on other datasets

Work Done

1. Database establishing

1.1 Database regarding AIM/Water for some hundred cities in china, from 1991-2000, yearly

To develop AIM/Water of city is one of the tasks of AIM/IMPACT research. In requirement of NIES team, data regarding water supply system, water use, Wastewater treatment system regarding data for some hundred cities in China were collected and the database was established. Each city was given a unique GBCODE (GBCODE 1999).

1.1.1 WATER SUPPLY AND WATER SAVING IN CITIES, *(BA92.XLS)*

- Production Capacity of Tap Water
- # Groundwater
- Length of Water Supply Pipelines
- Total Annual Volume of Water Supply
- For Productive Use
- For Residential Use
- For House Use
- Number of Residents with Access to Tap Water
- Number of Nonagricultural Population with Access to Tap Water
- Volume of Top Water in Plan
- Actual Consumption of Top Water
- Volume of Industrial Water Recycled
- Volume of Water Saving

1.1.2 **LEVEL OF FACILITIES FOR SUPPLY, UTILIZATION AND DISCHARGE OF WATER IN CITIES, *(BA93.XLS)***

- Per Capita Daily Consumption of Tap Water for Residential Use
- Percentage of Urban Population with Access to Tap Water
- Percentage of Nonagricultural Population with Access to Tap Water
- Water Discharge Pipelines Density
- Percentage of Sewage Treated
- Length of Water Discharge Pipelines
- Volume of Sewage Discharged
- Number of Sewage Plants
- Number of Biochemistry Plants
- Volume of Sewage Treated by Plants
- Volume of Sewage Treated by Biochemistry
- Volume of Sewage Treated by Facilities
- Total Annual Volume of Sewage Treated

1.1.3 BASIC STATISTICS ON POPULATION AT COUNTY LEVEL, *(DB03.XLS and DB06.XLS)*

- Total Households
- Total Population
- Number of Nonagricultural Population

1.1.4 NUMBER OF EMPLOYED PERSONS BY SECTOR IN CITIES, *(DQ16.XLS)*

- Farming, Forestry, Animal Husbandry and Fishery in District
- Mining and Quarrying in District
- Manufacturing in District
- Production and Supply of Electricity Gas and Water in District
- Construction in District
- Geological Prospecting and Water Conservancy in Downtown Area
- Transport, Storage, Post & Telecommunications in District
- Wholesale and Retail Trade &Catering Services in District
- Banking and Insurance in District
- Real Estate Trade by Region
- Real Estate Trade in Downtown Area
- Social Services in District
- Health Care, Sport &Social Welfare in District
- Education, Culture and Art, Radio, Film and Television in District
- Scientific Research and Polytechnic Services in District
- Government Agencies, Party Agencies and Social Organizations in District

1.1.5 GENERAL ECONOMY STATISTICS IN CITIES, *(DQ21.XLS)*

- Gross Domestic Product by District
- Primary Industry
- Secondary Industry
- Tertiary Industry

1.1.6 GROSS INDUSTRY OUTPUT VALUE IN CITIES, *(DQ41.XLS)*

- Gross Industry Output Value of District
- Gross Industrial Output Value At and Above Town in District
- Number of Industry At and Above Town in District

1.1.7 NUMBER OF FULL-TIME TEACHERS AND NUMBER OF STUDENT ENROLLMENT BY LEVEL AND TYPE OF SCHOOL IN CITIES, *(DQ81.XLS)*

- Number of Teachers in Institutions of Higher Education By District
- Number of Teachers in Secondary Schools By District
- Number of Teachers in Primary Schools By District
- Student Enrollment
- Student Enrollment
- Student Enrollment

1.1.8 NUMBER OF DOCTORS AND BEDS IN HOSPITAL IN CITIES, *(DQ87.XLS)*

- Number of Hospitals in District
- Number of Hospital Beds
- Number of Doctors

1.2 Water regarding dataset at province level for year 2001

1.2.1 PRECIPITATION AND SURFACE WATER BY PROVINCE, *(BA01.XLS)*

- Annual Precipitation
- Annual Precipitation
- Compared with the Volume of Last Year
- Compared with the Average Volume in Many Years
- Surface Water Resource
- Surface Water Resource
- Compared with the Volume of Last Year
- Compared with the Average Volume in Many Years

1.2.2 GROUND WATER RESOURCE BY PROVINCE, (*BA02.XLS)*

- Total Area
- Plain Area
- Ground Water Resource in Mountainous Provinces
- Ground Water Total Supply in Plains
- Ground Water Resource in Plains
- Overlap Between Plains and Mountainous Provinces
- Ground Water Resource by Province

1.2.3 TOTAL WATER RESOURCE BY PROVINCE, *(BA03.XLS)*

- Surface Water Resource
- Ground Water Resource
- Overlap Between Surface and Ground Water
- Total Water Resource Volume
- Water yield modulus
- Water yield modulus

.2.4 CAPACITY OF LARGE AND MEDIUM-SIZED RESERVOIRS BY PROVINCE, *(BA04.XLS)*

Number of Large Reservoirs

Capacity of Large Reservoirs in Last year-end

Capacity of Large Reservoirs in Current year-end

Annual Changeable Capacity of Large Reservoirs

Number of Medium-sized Reservoirs

Capacity of Medium-sized Reservoirs in Last year-end

Capacity of Medium-sized Reservoirs in Current year-end

Annual Changeable Capacity of Medium-sized Reservoirs

1.2.5 WATER SUPPLY BY PROVINCE, *(BA07.XLS)*

- Drawing from Surface Water
- Drawing from Other River Basins
- Drawing from Ground Water
- Drawing from Deep Ground Water
- Others
- Total Volume of Water Supply
- Utilized Volume of Sea Water

1.2.6 WATER UTILIZATION BY PROVINCE, *(BA08.XLS)*

- For Irrigation
- For Farming, Forestry, Animal Husbandry and Fishery Use
- For Industrial Use
- Consumption of Tap Water for Residential Use
- Utilized Volume of Water for Residential Use in Rural Area
- Total Volume of Water Consumption

1.2.7 WATER CONSUMPTION BY PROVINCE, *(BA09.XLS)*

- For Irrigation
- For Farming, Forestry, Animal Husbandry and Fishery Use
- For Industrial Use
- Consumption of Tap Water for Residential Use
- Consumption of Water for Residential Use in Rural Area
- Total Volume of Water Consumption
- Rate of Water Consumption

1.2.8 WATER UTILIZATION INDEX BY PROVINCE, *(BA10.XLS)*

- Per Capita GDP
- Per Capita Water Consumption
- Water Consumption for Producing 10000yuan GDP
- Consumption of Water for Per Mu Irrigated Areas
- Per Capita Consumption of Tap Water for Residential Use
- Per Capita Consumption of Water for Residential Use in Rural Area
- Water Consumption for Producing 10000yuan in Industry

1.2.9 **WATER QUALITY CONDITIONS BY PROVINCE (ANNUAL AVERAGE), *(BA11.XLS)***

- Evaluation Length
- Percentage to Total Evaluation Length
- Percentage to Total Evaluation Length
- Percentage to Total Evaluation Length
- Percentage to Total Evaluation Length
- Percentage to Total Evaluation Length
- Percentage to Total Evaluation Length

1.2.10 PRECIPITATION AND SURFACE WATER BY RIVER BASIN, *(BA14.XLS)*

- Annual Precipitation

- Annual Precipitation

- Compared with the Volume of Last Year
- Compared with the Average Volume in Many Years
- Surface Water Resource
- Surface Water Resource
- Compared with the Volume of Last Year
- Compared with the Average Volume in Many Years
- Water Resources Originating Outside the Country
- Total Natural Outflow
- Total Natural Outflow

1.2.11 CAPACITY OF LARGE AND MEDIUM-SIZED RESERVOIRS BY RIVER BASIN, *(BA15.XLS)*

- Total Area
- Plain Area
- Ground Water Resource in Mountainous Provinces
- Ground Water Total Supply in Plains
- Ground Water Resource in Plains
- Overlap Between Plains and Mountainous Provinces
- Ground Water Resource by Province

1.2.12 WATER SUPPLY BY RIVER BASIN, *(BA16.XLS)*

- Surface Water Resource
- Ground Water Resource
- Overlap Between Surface and groundwater
- Total Water Resource Volume
- Water yield modulus
- Water yield modulus

1.2.13 WATER UTILIZATION BY RIVER BASIN, *(BA17.XLS)*

- Number of Large Reservoirs
- Capacity of Large Reservoirs in Last year-end
- Capacity of Large Reservoirs in Current year-end
- Annual Changeable Capacity of Large Reservoirs
- Number of Medium-sized Reservoirs
- Capacity of Medium-sized Reservoirs in Last year-end
- Capacity of Medium-sized Reservoirs in Current year-end
- Annual Changeable Capacity of Medium-sized Reservoirs

1.1.14 WATER CONSUMPTION BY RIVER BASIN, *(BA18.XLS)*

- Drawing from Surface Water
- From Other River Basins
- Drawing from Ground Water
- From Deep Ground Water
- From Others
- Total Volume of Water Supply
- Utilized Volume of Sea Water

1.2.15 WATER UTILIZATION INDEX BY RIVER BASIN, *(BA19.XLS)*

- For Irrigation
- For Farming, Forestry, Animal Husbandry and Fishery Use
- For Industrial Use
- Consumption of Tap Water for Residential Use
- Utilized Volume of Water for Residential Use in Rural Area
- Total Volume of Water Consumption

1.2.16 IVER CONDITIONS BY RIVER BASIN(ANNUAL AVERAGE), *(BA20.XLS)*

- For Irrigation
- For Farming, Forestry, Animal Husbandry and Fishery Use
- For Industrial Use
- Consumption of Tap Water for Residential Use
- Consumption of Water for Residential Use in Rural Area
- Total Volume of Water Consumption

1.2.17 WATER QUALITY CONDITION BY RIVER BASIN (ANNUAL AVERAGE), *(BA21.XLS)*

- Evaluation Length
- Percentage to Total Evaluation Length
- Percentage to Total Evaluation Length
- Percentage to Total Evaluation Length
- Percentage to Total Evaluation Length
- Percentage to Total Evaluation Length
- Percentage to Total Evaluation Length

1.2.18 WATER UTILIZATION INDEX BY RIVER BASIN, *(BA22.XLS)*

- Per Capita GDP
- Per Capita Water Consumption
- Water Consumption for Producing 10000yuan GDP

  Consumption of Water for Per Mu Irrigated Areas
- Per Capita Consumption of Tap Water for Residential

  Use Per Capita Consumption of Water for Residential

  Use in Rural Area
- Water Consumption for producing 10000yuan in Industry

1.3 Environment regarding data at national, provincial and major cities level for 2000 and 2001, yearly

1.3.1 Waste water discharge and treatment by province, *(rl342000-2001.xls)*

- Number of Industrial Enterprises
- Total Volume of Waster Water Discharged
- Discharge to Sea Directly
- Volume of Industrial Waster Water up to the Discharge Standards Discharged
- Volume of Treated Industrial Waster Water up to the Discharge Standards Discharged
- Volume of Hydrargyrum Discharged
- Volume of Cadmium Discharged
- Volume of Sexivalent Chrome Discharged

- Volume of Lead Discharged
- Volume of Arsenic Discharged
- Volume of Phenol Discharged
- Volume of Cyanide Discharged
- Volume of COD Discharged
- Volume of Earth Oil Discharged
- Volume of Suspended Matter Discharged
- Volume of Sulfide Discharged
- Number of Facilities for Treatment of Waste Water
- Number of Normal Running Facilities for Treatment of Waste Water
- The Prices of Facilities for Treatment of Waste Water
- Current Year Operating Expense
- Volume of Industrial Waster Water Treated

- Volume of Industrial Waster Water Recovered After Treatment
- Volume of Hydrargyrum Removed
- Volume of Cadmium Removed
- Volume of Sexivalent Chrome Removed
- Volume of Lead Removed
- Volume of Arsenic Removed
- Volume of Phenol Removed
- Volume of Cyanide Removed
- Volume of COD Removed
- Volume of Earth Oil Removed
- Volume of Suspended Matter Removed
- Volume of Sulfide Removed

1.3.2 Waste gases emissions and treatment by province, *(rl352000-2001.xls)*

- Total Volume of Waster Gas Emission
- Volume of Waster Gas in the Process of Fuel Burning
- Volume of Gas with Soot & Dust Removed
- Volume of Waste Gas from the Process of Production
- Volume of Gas Purified
- Volume of Sulphur Dioxide Removed
- Volume of Sulphur Dioxide Removed from the Burning Process of Fuels
- Volume of Sulphur Dioxide Removed from the Process of Production
- Volume of Sulphur Dioxide Emission
- Volume of Sulphur Dioxide Emission from the Burning Process of Fuels

- Volume of Sulphur Dioxide Emission from the Process of Production
- Volume of Industrial Soot Removed
- Volume of Industrial Soot Emission
- Volume of Industrial Dust Removed
- Volume of Industrial Dust Emission
- Number of Facilities for Treatment of Waste Gas
- Work in normal
- The Prices of Facilities for Treatment of Waste Water
- Current Year Operating Expense
- Bunker Coal Consumption
- Coal Consumption
- Fuel Oil Consumption

1.3.3 Industrial solid waste production, treatment and reuse by province, *(rl362000-2001.xls)*

- Volume of Industrial Solid Wastes Produced
- Dangerous Wastes
- Making Throw Away Slag
- Fly Ash
- Cinder
- Duns
- Tails
- Radioactive Waste Materials
- Other Wastes
- Volume of Industrial Solid Wastes Utilized in a Comprehensive Way
- Dangerous Wastes
- Making Throw Away Slag

- Fly Ash
- Cinder
- Duns
- Tails
- Other Wastes
- Volume of Industrial Solid Wastes Accumulated
- Volume of Dangerous Wastes Accumulated
- Total Volume of Industrial Solid Wastes Accumulated Over the Years
- Areas Occupied by Industrial Solid Wastes
- Volume of Industrial Solid Wastes Treated
- Dangerous Wastes
- Volume of Industrial Solid Wastes Discharged
- Dangerous Wastes

1.3.4 Industrial enterprises by province, *(rl392000-2001.xls)*

- Gross Industrial Output Value (calculated at current prices)
- Gross Industrial Output Value (calculated in accordance with 1990)
- Total Number of Staff & Workers
- Number of Full Time Environmental Persons
- Output Value of Products Made from Waste Gas, Waste Water and Solid Wastes
- Profits Obtained from Use of Waste Gas, Waste Water and Solid Wastes
- Number of Industrial Boilers
- Volume of Industrial Boiler

- Number of Industrial Boilers Treated Waste Gas up to Discharge Standards
- Volume of Treated Waste Gas up to Discharge Standards
- Number of Industrial Kilns
- Number of Industrial Kilns Treated Waste Gas up to Discharge Standards
- Volume of Industrial Water
- Volume of Fresh Water
- Volume of Industrial Water Recovered after Treatment

1.3.5 Regulating efficiency of "three" wastes from key industrial enterprises by province, *(rl302000-2001.xls)*

- Percentage of Industrial Waste Water up to the Discharge Standards
- Percentage of Industrial Waste Water Treated
- Percentage of Industrial Waste Water Treated up to the Discharge Standards
- Percentage of Waste Gas with Soot &Dust Removed
- Percentage of Waste Gas Purified
- Percentage of Industrial Solid Wastes Utilized
- Percentage of Industrial Solid Wastes Accumulated
- Percentage of Industrial Solid Wastes Treated

1.3.6 Environment pollution and damage incidents by province, *(rl402000-2001.xls)*

- Number of Pollution Accidents
- Losses of Converted into Cash
- Number of Extraordinarily Serious Pollution Accidents
- Losses of Extraordinarily Serious Pollution Accidents Converted into Cash
- Number of Serious Pollution Accidents
- Losses of Serious Pollution Accidents Converted into Cash
- Number of Biggish Pollution Accidents
- Losses of Biggish Pollution Accidents Converted into Cash
- Number of Ordinary Pollution Accidents
- Losses of Ordinary Pollution Accidents Converted into Cash
- Number of Water Pollution Accidents
- Losses of Water Pollution Accidents Converted into Cash

- Number of Air Pollution Accidents
- Losses of Air Pollution Accidents Converted into Cash
- Number of Solid Wastes Pollution Accidents
- Losses of Solid Wastes Pollution Accidents Converted into Cash
- Number of Noise and Vibration Pollution Accidents
- Losses of Noise Vibration Pollution Accidents Converted into Cash
- Number of Others
- Losses of Other Pollution Accidents Converted into Cash
- Number of Injuries & Deaths
- Number of Deaths
- Area of Crop Polluted
- Area of Fish Polluted
- Area of Nature Reserves Polluted
- Amount of Fines
- Amount of Reparations

.3.7 Industrial wastewater discharge and treatment at national evel, *(rl612000-2001.xls)*

Number of Industrial Enterprises

Total Volume of Industrial Waste Water Discharged

Volume of Industrial Waste Water Discharged to Sea Directly

Volume of Industrial Waster Water up to the Discharge Standards Discharged

Volume of Treated Industrial Waster Water up to the Discharge Standards Discharged

Volume of Hydrargyrum Discharged

Volume of Cadmium Discharged

Volume of Sexivalent Chrome Discharged

Volume of Lead Discharged

Volume of Arsenic Discharged

Volume of Phenol Discharged

- Volume of Cyanide Discharged
- Volume of COD Discharged
- Volume of Earth Oil Discharged
- Volume of Suspended Matter Discharged
- Volume of Sulfide Discharged
- Number of Facilities for Treatment of Waste Water
- Number of Normal Running Facilities for Treatment of Waste Water
- The Prices of Facilities for Treatment of Waste Water
- Current Year Operating Expense
- Volume of Industrial Waster Water Treated
- Volume of Industrial Waster Water Recovered After Treatment

- Volume of Hydrargyrum Removed
- Volume of Cadmium Removed
- Volume of Sexivalent Chrome Removed
- Volume of Lead Removed
- Volume of Arsenic Removed
- Volume of Phenol Removed
- Volume of Cyanide Removed
- Volume of COD Removed
- Volume of Earth Oil Removed
- Volume of Suspended Matter Removed
- Volume of Sulfide Removed

1.3.8 Industrial waste gases emissions and treatment at national level, *(rl622000-2001.xls)*

- Total Volume of Waster Gas Emission
- Volume of Waster Gas Emission
- Volume of Gas with Soot & Dust Removed
- Volume of Waste Gas from the Process of Production
- Volume of Gas Purified
- Volume of Sulphur Dioxide Removed
- Volume of Sulphur Dioxide Removed from the Burning Process of Fuels
- Volume of Sulphur Dioxide Removed from the Process of Production
- Volume of Sulphur Dioxide Emission

- Volume of Sulphur Dioxide Emission from the Burning Process of Fuels
- Volume of Sulphur Dioxide Emission from the Process of Production
- Volume of Industrial Soot Removed
- Volume of Industrial Soot Emission
- Volume of Industrial Dust Removed
- Volume of Industrial Dust Emission
- Number of Facilities for Treatment of Waste Gas
- Work in normal
- The Prices of Facilities for Treatment of Waste Water
- Current Year Operating Expense
- Bunker Coal Consumption
- Coal Consumption
- Fuel Oil Consumption

1.3.9 Industrial solid waste production and treatment at national level, *(rl632000-2001.xls)*

- Volume of Industrial Solid Wastes Produced
- Dangerous Wastes
- Making Throw Away Slag
- Fly Ash
- Cinder
- Duns
- Tails
- Radioactive Waste Materials
- Other Wastes
- Volume of Industrial Solid Wastes Utilized in a Comprehensive Way
- Dangerous Wastes
- Making Throw Away Slag

- Fly Ash
- Cinder
- Duns
- Tails
- Other Wastes
- Volume of Industrial Solid Wastes Accumulated
- Volume of Dangerous Wastes Accumulated
- Total Volume of Industrial Solid Wastes Accumulated Over the Years
- Areas Occupied by Industrial Solid Wastes
- Volume of Industrial Solid Wastes Treated
- Dangerous Wastes
- Volume of Industrial Solid Wastes Discharged
- Dangerous Wastes

1.3.10 **Basic condition by industry branch of industrial enterprises at national level, *(rl692000-2001.xls)***

- Gross Industrial Output Value (calculated at current prices)
- Gross Industrial Output Value (calculated in accordance with 1990)
- Total Number of Staff & Workers
- The Number of Full Time Environmental Persons
- Output Value of Products Made from Waste Gas, Waste Water and Solid Wastes
- Profits Obtained from Use of Waste Gas, Waste Water and Solid Wastes
- Number of Industrial Boilers

- Volume of Industrial Boiler
- Number of Industrial Boilers Treated Waste Gas up to Discharge Standards
- Volume of Treated Waste Gas up to Discharge Standards
- Number of Industrial Kilns
- Number of Industrial Kilns Treated Waste Gas up to Discharge Standards
- Volume of Industrial Water
- Volume of Fresh Water
- Volume of Industrial Water Recovered after Treatment

.3.11 Industrial waste water discharge and treatment in major ities, *(rl512000-2001.xls)*

Number of Industrial Enterprises

Total Volume of Industrial Waste Water Discharged

Volume of Industrial Waste Water Discharged to Sea Directly

Volume of Industrial Waster Water up to the Discharge Standards for Discharged

Volume of Treated Industrial Waster Water up to the Discharge Standards

Volume of Industrial Waster Water Treated

Volume of Industrial Waster Water Recovered after Treatment

Number of Facilities for Treatment of Waste Water

Work in Normal

The Prices of Facilities for Treatment of Waste Water

Current Year Operating Expense

- Volume of Hydrargyrum Discharged
- Volume of Cadmium Discharged
- Volume of Sexivalent Chrome Discharged
- Volume of Lead Discharged
- Volume of Arsenic Discharged
- Volume of Phenol Discharged
- Volume of Cyanide Discharged
- Volume of COD Discharged
- Volume of Earth Oil Discharged
- Volume of Suspended Matter Discharged
- Volume of Sulfide Discharged
- Volume of Hydrargyrum Removed
- Volume of Cadmium Removed

- Volume of Sexivalent Chrome Removed
- Volume of Lead Removed
- Volume of Arsenic Removed
- Volume of Phenol Removed
- Volume of Cyanide Removed
- Volume of COD Removed
- Volume of Earth Oil Removed
- Volume of Suspended Matter Removed
- Volume of Sulfide Removed

1.3.12 Industrial waste gases emissions and treatment in major cities, *(rl522000-2001.xls)*

- Total Volume of Waster Gas Emission
- Volume of Waster Gas Emission
- Volume of Gas with Soot & Dust Removed
- Volume of Waste Gas from the Process of Production
- Volume of Gas Purified
- Volume of Sulphur Dioxide Removed
- Volume of Sulphur Dioxide Removed from the Burning Process of Fuels
- Volume of Sulphur Dioxide Removed from the Process of Production
- Volume of Sulphur Dioxide Emission

- Volume of Sulphur Dioxide Emission from the Burning Process of Fuels
- Volume of Sulphur Dioxide Emission from the Process of Production
- Volume of Industrial Soot Removed
- Volume of Industrial Soot Emission
- Volume of Industrial Dust Removed
- Volume of Industrial Dust Emission
- Number of Facilities for Treatment of Waste Gas
- Work in normal
- The Prices of Facilities for Treatment of Waste Water
- Current Year Operating Expense
- Bunker Coal Consumption
- Coal Consumption
- Fuel Oil Consumption

1.3.13 Industrial solid waste production and treatment in major cities, *(rl532000-2001.xls)*

- Volume of Industrial Solid Wastes Produced
- Dangerous Wastes
- Making Throw Away Slag
- Fly Ash
- Cinder
- Duns
- Tails
- Radioactive Waste Materials
- Other Wastes
- Volume of Industrial Solid Wastes Utilized in a Comprehensive Way
- Dangerous Wastes

- Cinder
- Duns
- Tails
- Other Wastes
- Volume of Industrial Solid Wastes Accumulated
- Volume of Dangerous Wastes Accumulated
- Total Volume of Industrial Solid Wastes Accumulated Over the Years
- Areas Occupied by Industrial Solid Wastes
- Volume of Industrial Solid Wastes Treated
- Dangerous Wastes
- Volume of Industrial Solid Wastes Discharged
- Dangerous Wastes
- Fly Ash
- Making Throw Away Slag

1.3.14 Industrial enterprises in major cities, *(rl572000-2001.xls)*

- Gross Industrial Output Value (calculated at current prices)
- Gross Industrial Output Value (calculated in accordance with 1990)
- Total Number of Staff & Workers
- The Number of Full Time Environmental Persons
- Output Value of Products Made from Waste Gas, Waste Water and Solid Wastes
- Profits Obtained from Use of Waste Gas, Waste Water and Solid Wastes
- Number of Industrial Boilers
- Volume of Industrial Boiler

- Number of Industrial Boilers Treated Waste Gas up to Discharge Standards
- Volume of Treated Waste Gas up to Discharge Standards
- Number of Industrial Kilns
- Number of Industrial Kilns Treated Waste Gas up to Discharge Standards
- Volume of Industrial Water
- Volume of Fresh Water
- Volume of Industrial Water Recovered after Treatment

1.4 Acid rain observation data of 87 stations for year 2000 and 2001

1.4.1 Annual average of observation value in 87 acid rain stations in China(2000-2001), *(Annual-acid rain2000-2001.xls)*

- Year
- Month
- Annual total precipitation
- Times for precipitation
- Annual average precipitation
- Annual maximum pH
- Annual maximum pH
- Percentage for pH<4.5
- Percentage for pH<5.6
- Annual average conductance
- Annual maximum conductance
- Annual minimum conductance

1.4.2 Monthly average of observation value in 87 acid rain stations in China(2000-2001), *(Monthly-acid rain2000-200.xls)*

- Year
- Month
- Monthly total Precipitation
- Times for Precipitation
- Monthly average Precipitation
- Monthly maximum pH
- Monthly minimum pH
- Frequence of pH<4.5
- Percentage for pH<4.5

- Frequence of pH<5.6
- Percentage for pH<5.6
- Frequence of pH<6.9
- Percentage for pH<6.9
- Frequence of pH<7.0
- Percentage for pH<7.0
- Monthly average conductance
- Monthly maximum conductance
- Monthly minimum conductance

1.4.3 Daily average of observation value in 87 acid rain stations in China(2000-2001), *(Daily-acidrain2000-2001.xls)*

- Year
- Month
- Start-date
- End-date
- Start-time
- End-time
- pH
- Conductance
- Temperature
- Precipitation
- Phenomena of Weather

1.5 Mean temperature dataset at 1 square kilometer level of China (Based on the data from more than 600 stations over China)

1.5.1 Annual mean temperature from 1961-1998, year by year

1.5.2 Annual mean temperature (Classified by 2℃) from 1961-1998, year by year

1.5.3 Monthly mean temperature from 1961-1998,year by year

1.5.4 Monthly mean temperature (Classified by 2℃) from 1961-1995, year by year

1.5.5 Ten days mean temperature from 1961-1998, year by year

1.5.6 Ten days mean temperature (Classified by 2℃) from 1961-1998, year by year

1.6 Administrative district regarding dataset

1.6.1 County boundary map(2002 edition) *(ch02g.e00, ch02gdesc.doc)*

1999 edition was updated to reflect the changes in county boundaries as for 2002.

1.6.2 Changes of administrative units between 2000-2001, *(boundchange.doc)*

Changes of administrative units in each province were recorded annually from 2000 to 2001.

1.6.3 Database of GB/T 2260-2002 was set up *(gbcode-2002.xls)*

- Administrative district name in GB/T 2260-2002 (in Chinese)
- Administrative district name in GB/T 2260-2002 (in Chinese Pinyin)
- Administrative district Changes between 1999 and 2002
- Administrative district name in GB/T 2260-1999 (in Chinese)

1.7 Other Data Collection

1.7.1 Codes for the administrative divisions of the People's Republic of China, GB/T 2260-2002

1.7.2 2001 Report on the State of the Environment in China

1.7.3 China Environment Statistic Annual Report 2001

1.7.4 China Water Resources Status Report 2001

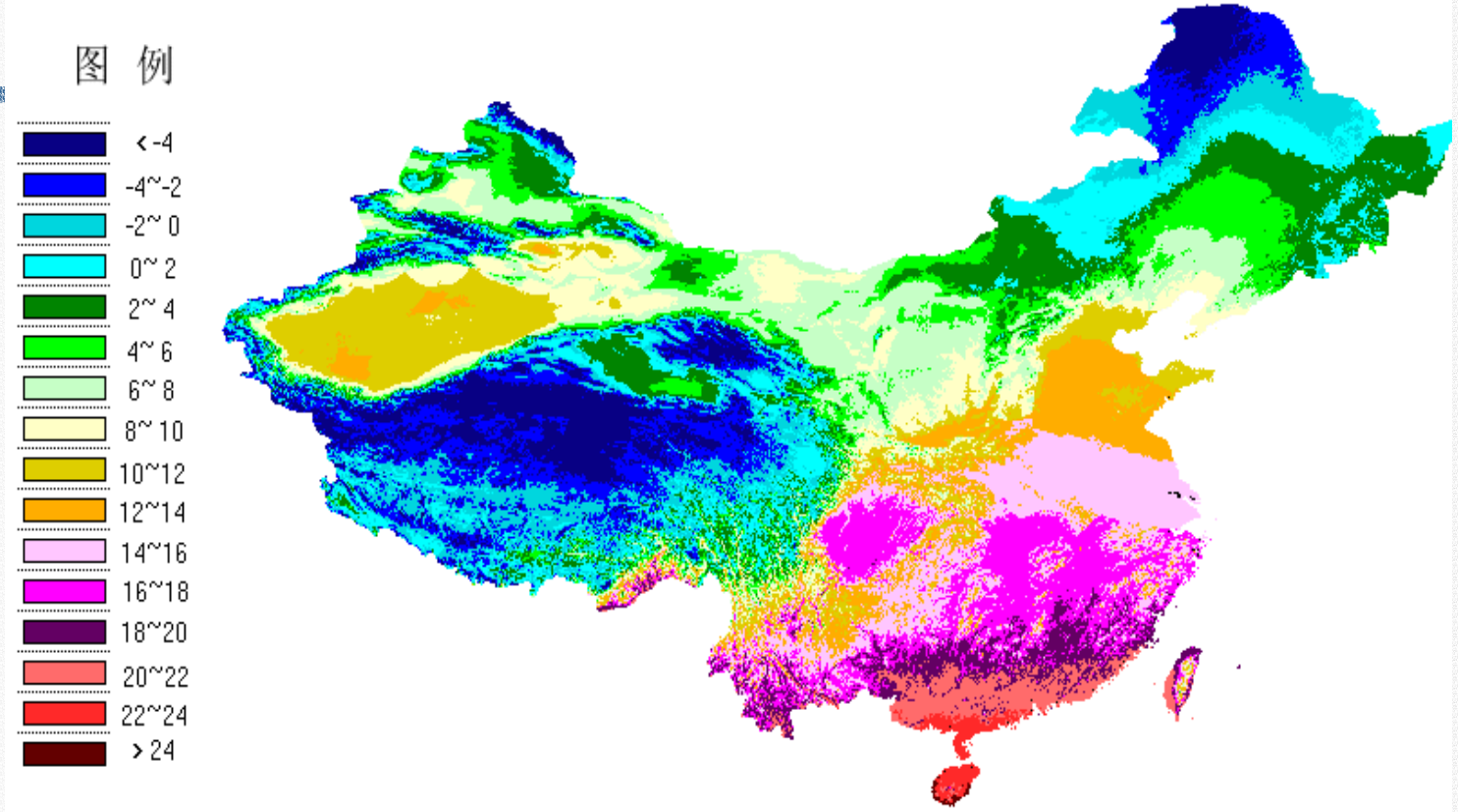
2. Research on 1 square kilometer level Data developing

1 sq.km. is a essential data scale in the filed of global change research while most attribute data is at station, county, region etc. level. Therefore, spatialization of attribute data is one of forward issues in the field of GIS . In order to meet the needs of global change research, some research was done during the year.

2.1 Spatialization of Observed data(temperature from 624 meteorological stations over China)

During the research,30-year mean temperature data from 624 meteorological stations over China was used. The temperature was divided into regular component and irregular component. The regular component is affected by longitude, latitude and altitude while irregular component affected by other local factors. They were specialized with multiple variable regression and inverse distance weighted interpolation respectively. There was correlation ratio of R=0.98 between temperature and geographical factors including longitude, latitude and altitude. Summing the two specialized components generated grid-based temperature data. It can reflect temperature change both at large scale and at small scale.

This method was used to spatialize monthly and ten day mean temperature for 35 years(1961-1995) later. The results are fine. The correlation ratio of R>0.92 between temperature and geographical factors including longitude, latitude and altitude. The lowest R is 0.92, the high R is 0.99 and the mean R is 0.97.



Distribution figure of China’s mean temperature(Classified by 2℃)

2.2 GIS Based Spatialization of Population Census Data in Qinghai-Tibet Plateau

In the Qinghai-Tibet Plateau, correlation ratios between population density and percentages of arable land and city and town used land at county level reach 0.90 and 0.85 respectively. In Qinghai province, there exists a logarithmic correlation of ratio =-0.86 between population density and average territorial elevation at county level. There is a correlation of ratio =0.82 between population density and main highway density at county level. Correlation ratios between population density and densities of city and town residential areas, township residential areas and village residential areas reach 0.82, 0.87 and 0.92 respectively. Density of residential areas drops along with increasing of distance to rivers. Therefore, territorial elevation, land use, road and river system are the main factors affecting distribution of population in the Qinghai-Tibet Plateau. Residential areas are an important indicator to distribution of population. Weight values of affecting factors are assigned objectively and multiple sources data fusion technology is applied to specialize population census data. There is a correlation of ratio >0.80 between the population density generated by data fusion and actual population at county level, and ratio >0.75 at township level. The finally generated grid population density not only deeps consistence with statistical population data at county level but also reflects changes of population distribution inside each county.

3. Other related research

Relationships of Energy Consumption to Economy and Climate and Their Changes in China

Data（1） Data of energy Consumption and economy

- Annual total energy consumption and its composition in 1953-1999 in the whole country
- Annual coal and electricity consumption in residential energy consumption in 1980~1999 in the whole country
- National coal, oil and hydroelectricity consumption in 1953—1999
- Gross domestic product (GDP) in 1953-1999 in the whole country

source: *China energy statistical yearbook* and *China statistical yearbook*

Data (2)

- **Data of meteorological disaster**

  annual areas of crops covered by drought and flood in 1953-1999 in the whole country

Source: *China's statistical yearbooks* and *China's disaster reports*

- **Climatic data**

  mean daily temperature data of 29 provincial meteorological stations in the whole country from 1970 to 1999

Source: China Meteorological Administration

Method (1)

- **Methed dividing energy consumption**

y = yt + yw + ye

Among them: y—real consumption of energy

y_t—— trend quantity of the energy consumption （namely socioeconomic energy consumption）, by polynomial method

y_w—fluctuate quantity(namely climate energy consumption

y_e—random quantity , ignored

Method (2)

Method Calculating Climatic Index

- Calculating heating degree-day(D_h)

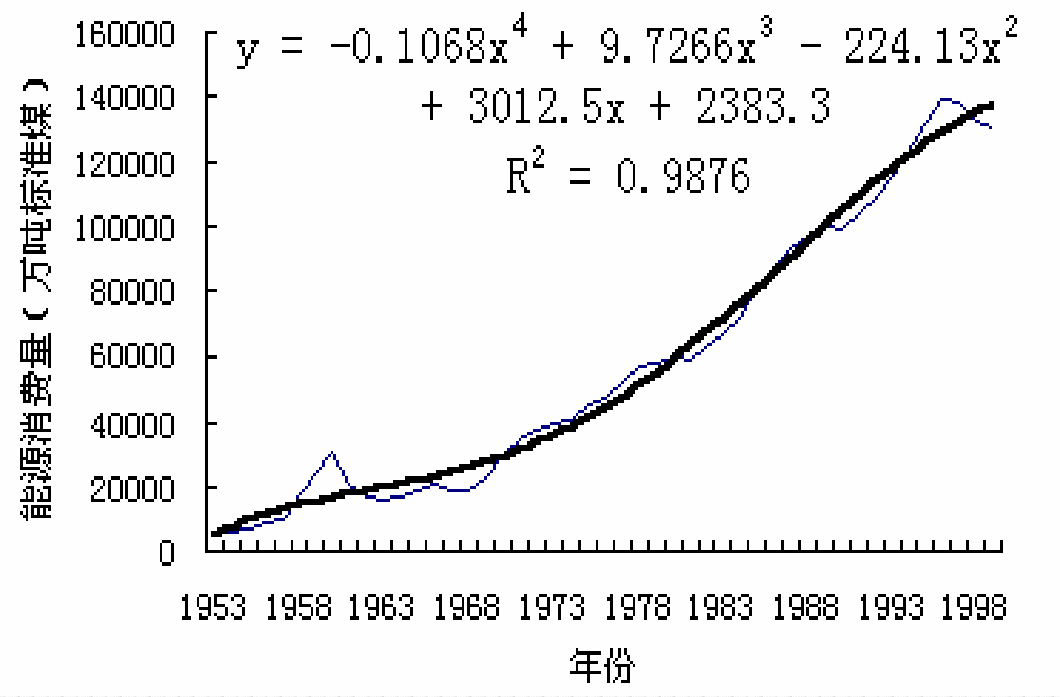
$T_{hi} = T_b - T_i$ $\quad \boldsymbol{D_h = \Sigma T_{hi}}$ $\quad T_b = 5℃$

- Calculating cooling degree-day(D_c)

$T_{ci} = T_i - T_b$ $\quad \boldsymbol{D_c = \Sigma T_{ci}}$ $\quad T_b = 22℃$

Result1: Results dividing energy consumption(1)

- Results dividing energy consumption

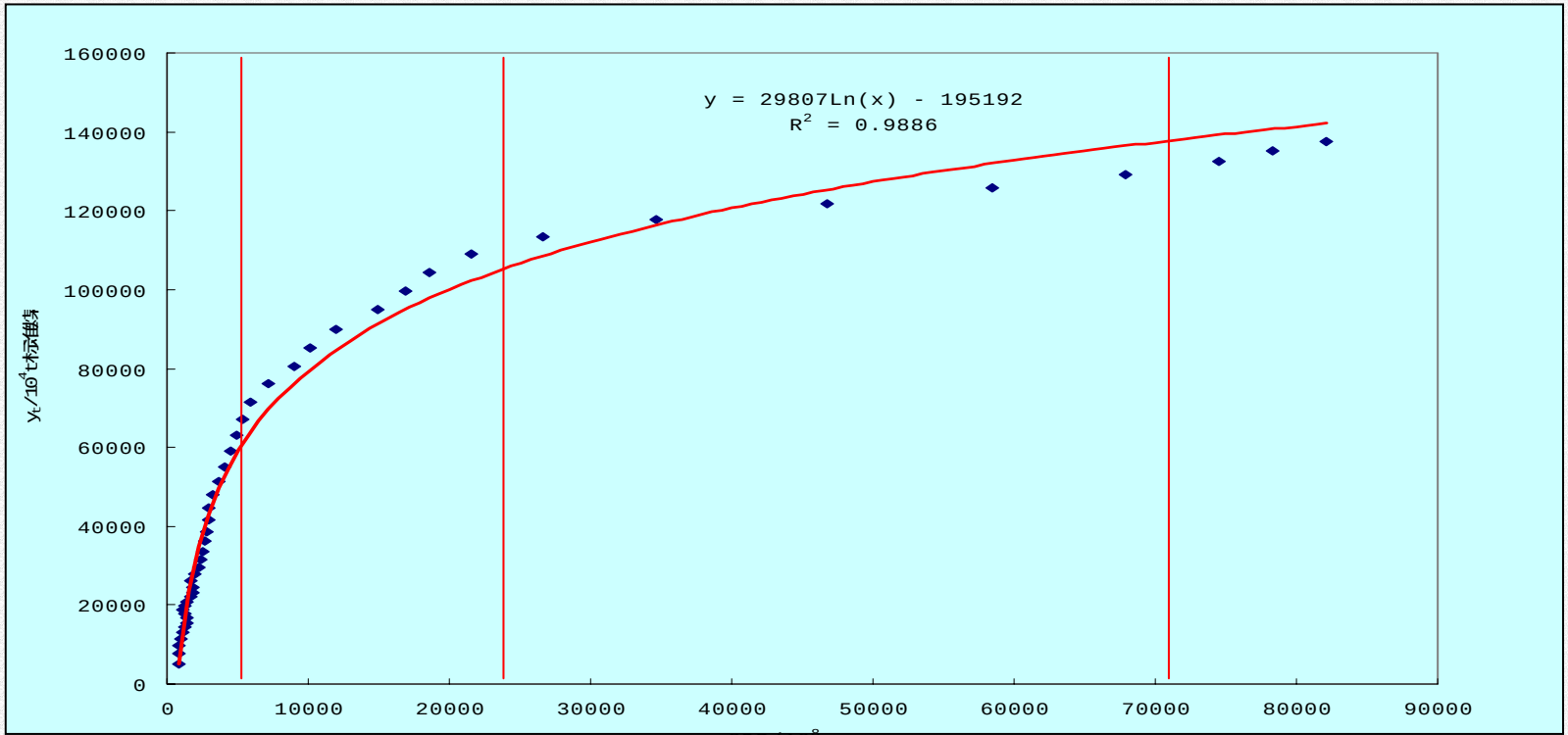


Result1： Results dividing energy consumption(2)

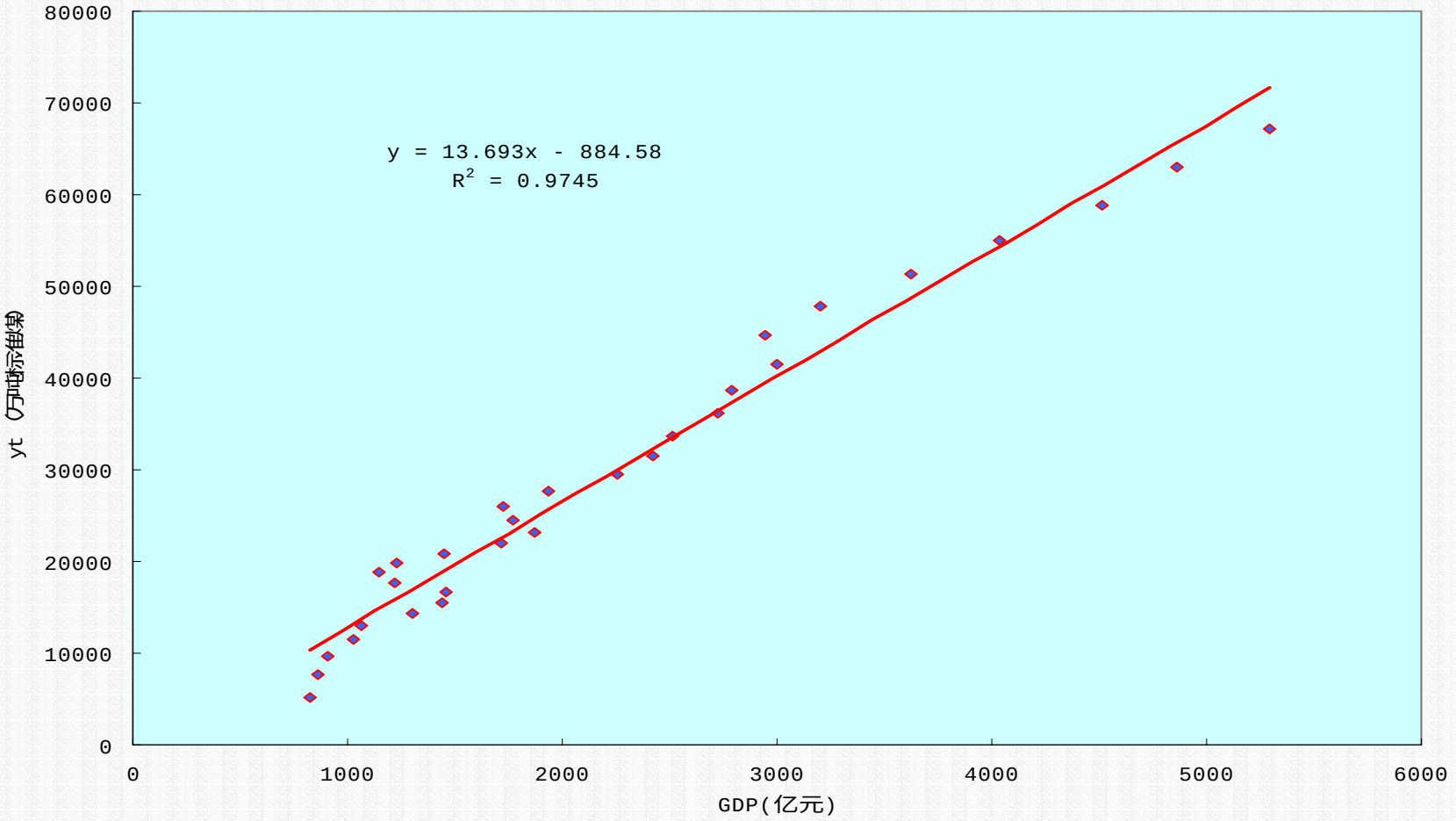
- Coal consumption ：$y_t = -0.1543x^4 + 14.196x^3 - 375.47x^2 + 4342.6x - 856.75$
- Oil consumption ：$y_t = 0.0789x^3 + 4.8201x^2 + 221.72x - 917.54$
- Natural gas consumption ：$y_t = -0.0647x^3 + 4.9796x^2 - 38.163x + 41.832$
- Hydroelectricity consumption ：$y_t = 5.1733x^2 - 67.144x + 479.8$

Result2:Energy consumption and economy(1)

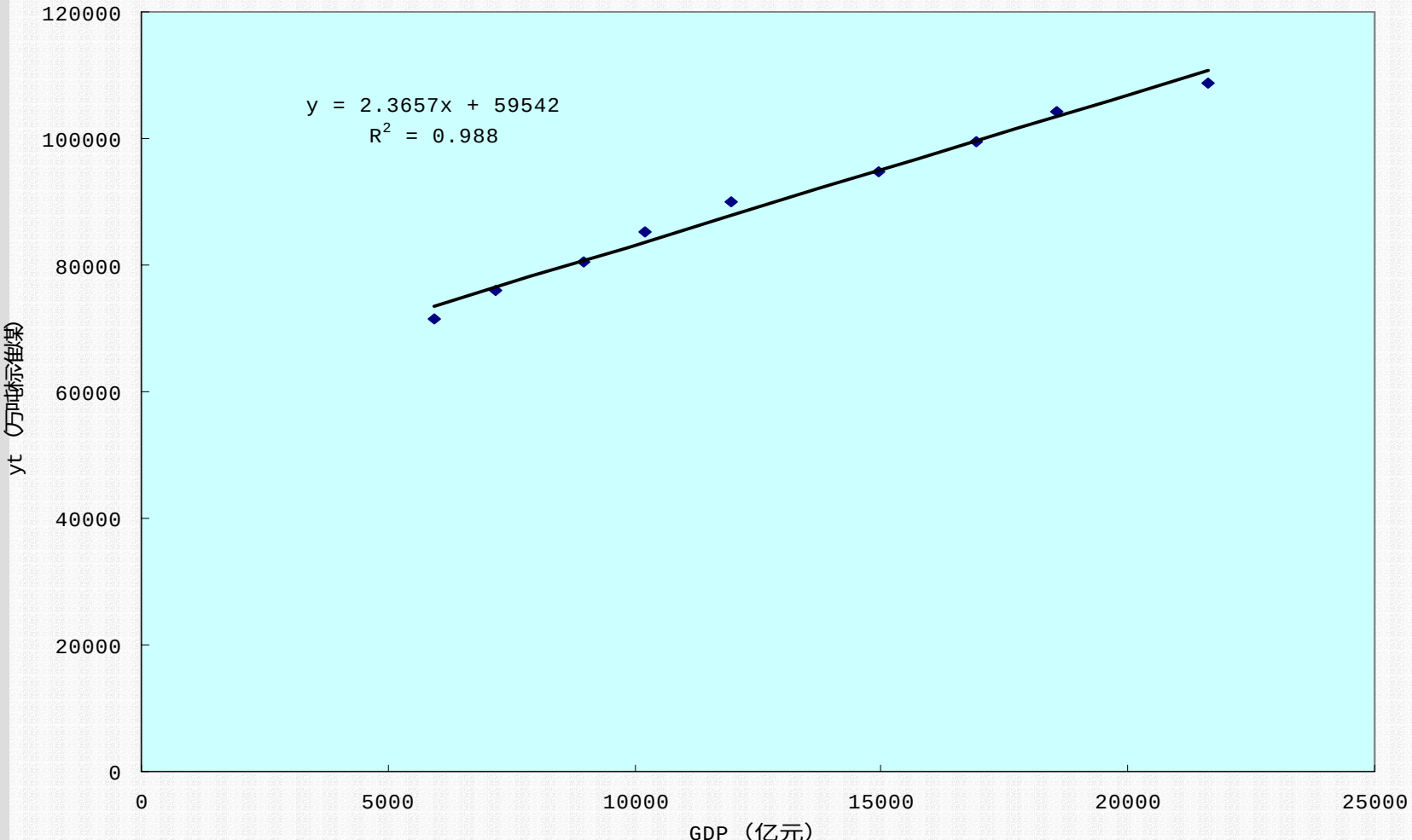
- **transiting from the resource-dense industry with high energy consumption to the technology-dense industry with low energy consumption**



Result2:Energy consumption and economy(2) in 1953-1982



Result2:Energy consumption and economy(3) in 1983-1991



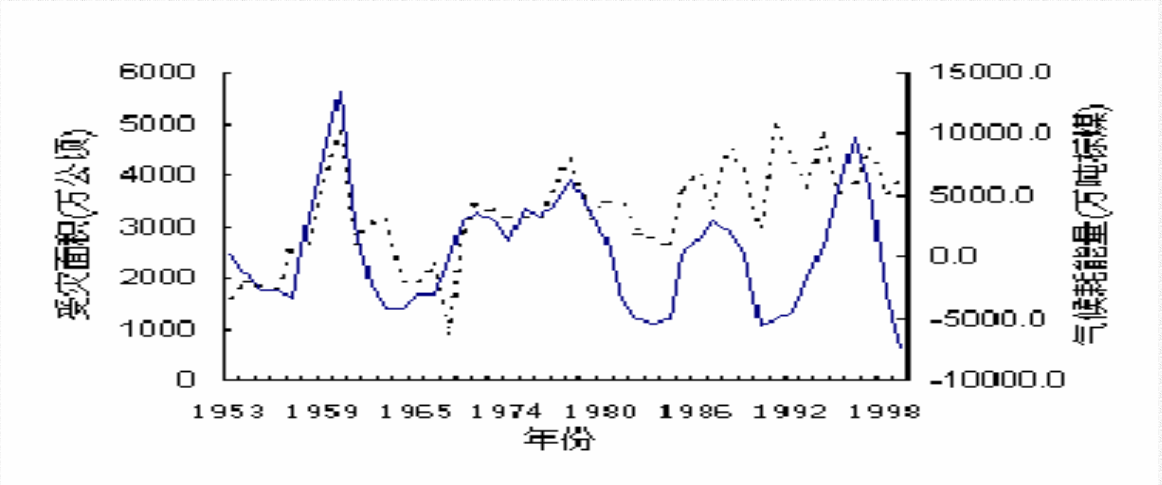
Result2:Energy consumption and economy(4)

Driving factors of energy consumption from society and economy

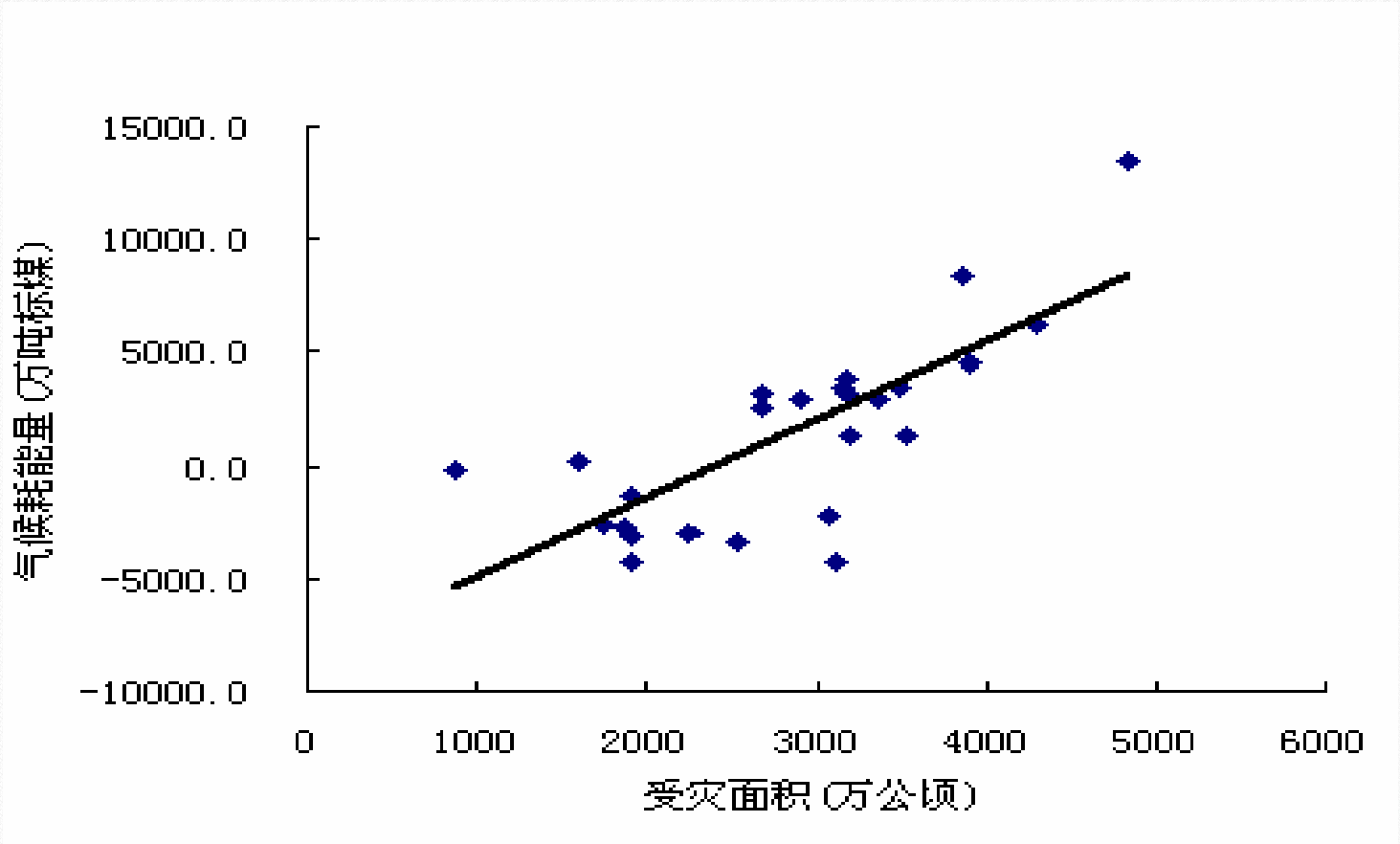
- **technological progress**
- **energy substitution**
- **industrial structure adjustment**
- **foreign trade**
- **changes of residential energy consumption**

Result3：energy consumption and area covered by drought and flood（1）

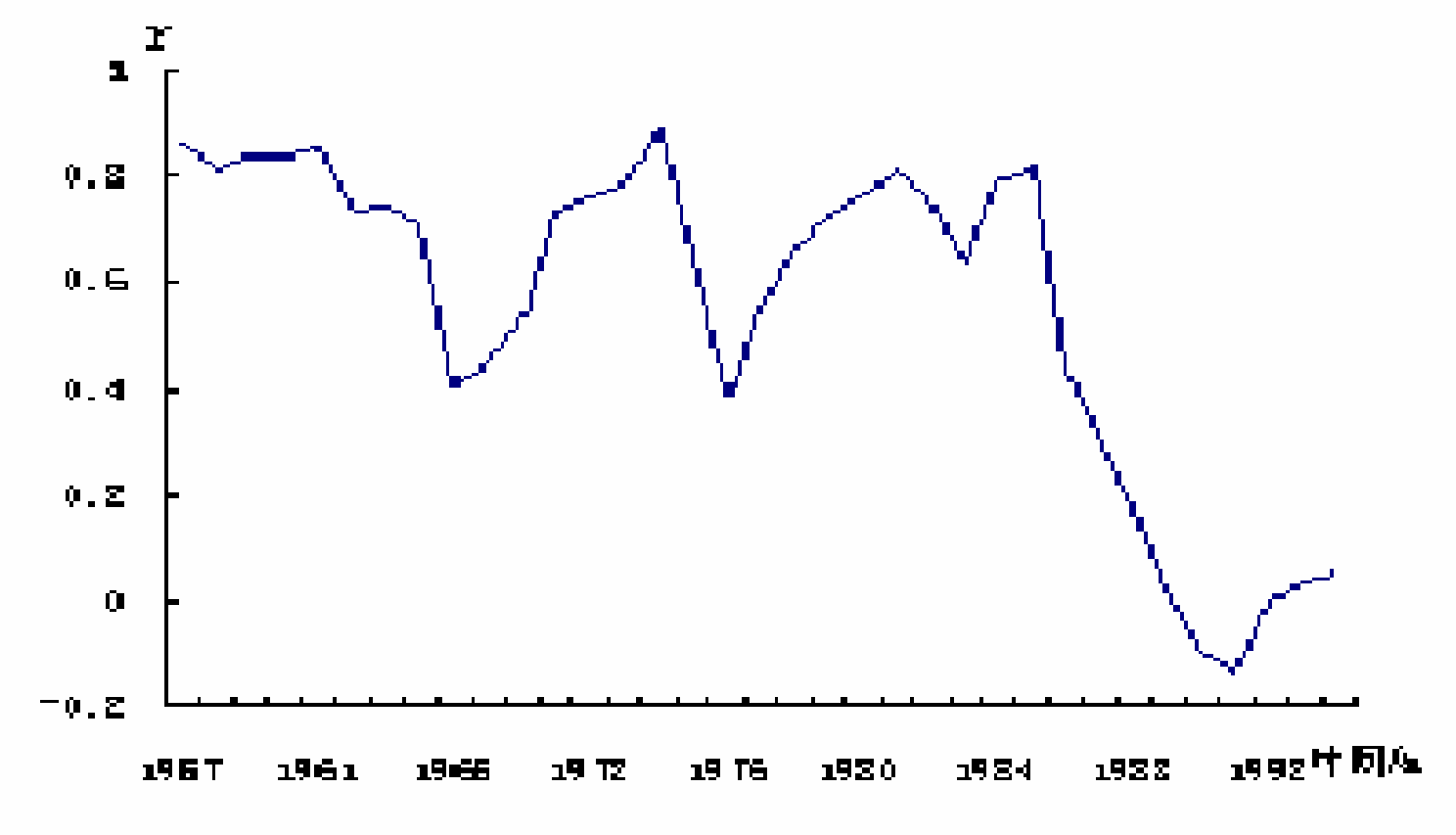
- Relationship of energy consumption to area covered by drought and flood is obvious, but changes no obvious after early 1980s.



Result3：energy consumption and area covered by drought and flood in 1953-1980(2)

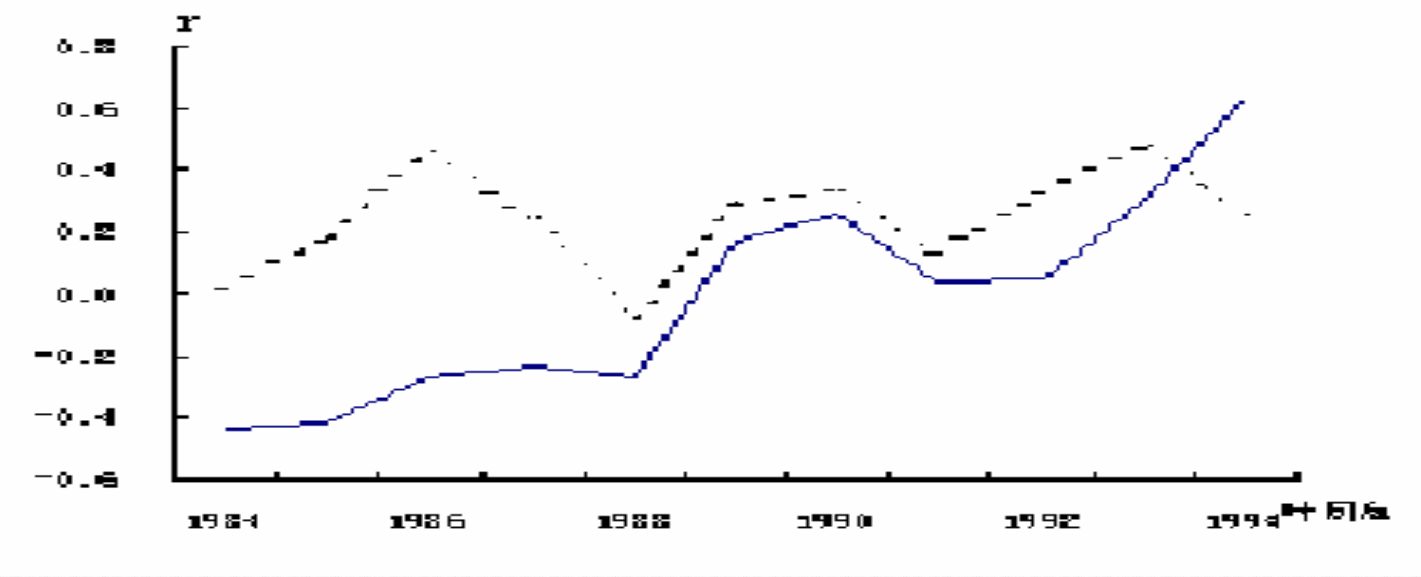


Result3：energy consumption and area covered by drought and flood: changes of correlation coefficient in1953-1999(3)



Result4: energy consumption and temperature

- Relationship of energy consumption to temperature is not obvious, but increasing



Conclusions

- **Tranforming from the resource-dense industry with high energy consumption to the technology-dense industry with low energy consumption**
- **Tranforming from drived by the disaster of droughts and flood to drived by the temperature**
- **Tranform is a quite long course, sometimes even several subordinate stages.**

Work Plan

1. **Work dedicated by AIM team;**
2. **Research on spatialization of observed data and socio-**economic

3. 1 square kilometer level data developing

- Mean temperature
- Mean high temperature
- Mean low temperature
- Mean precipitation
- Population
- GDP per unit area

4. Further work on other databasets

- Natural resources
- Population
- socio-economic indicators


Thanks