Analysis on Population Movement Intensities in China

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9th AIM International Workshop, March 11-15, NIES, Tsukuba, Japan, 2004

1. Introduction

Migration has been an important part of human experience throughout the history, and these migration flows continue to play an important role in shaping the populations of cities, states, and regions.

1. Introduction

China government does not provide detail population movement data until 5th population census in year 2000, as strict population registration system disregard the facts of huge volume of population movement.

2. Objective

To produce a genuine population distribution map for down-streaming study such as socio-economic development planning and environment assessment.

3. Data Preparation and Analysis

$$I_i = M_i / P_r \times 100$$

$$I_o = M_o / P_r \times 100$$

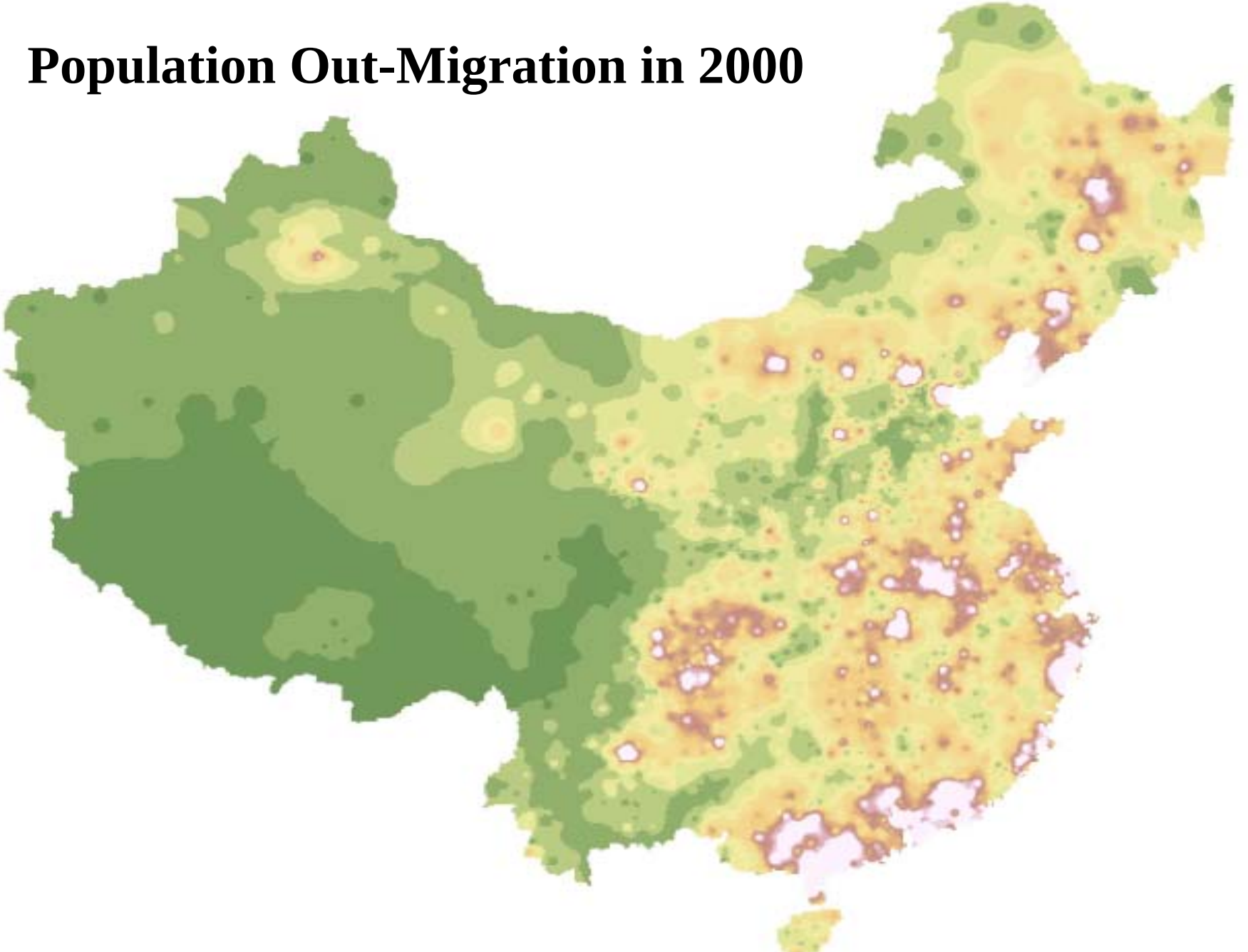
$$I_m = (M_i + M_o) / P_r \times 100$$

I_i : the intensity of in-migration, I_o : the intensity of out-migration,

M_i :the amount of in-migrants, M_i : the amount of out-migrants,

P_r : the registered population, I_m : the intensity of migration.

Population Out-Migration in 2000



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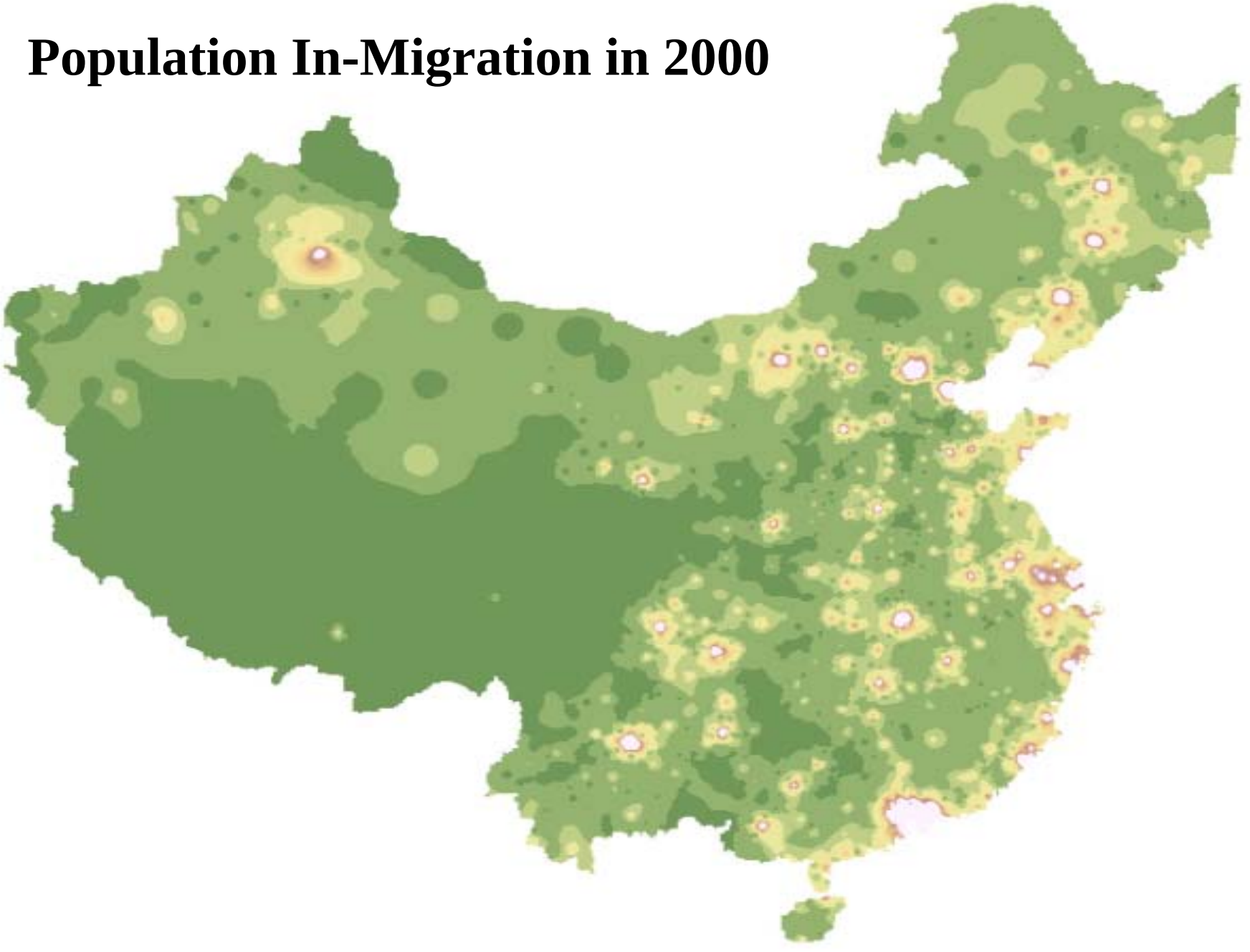
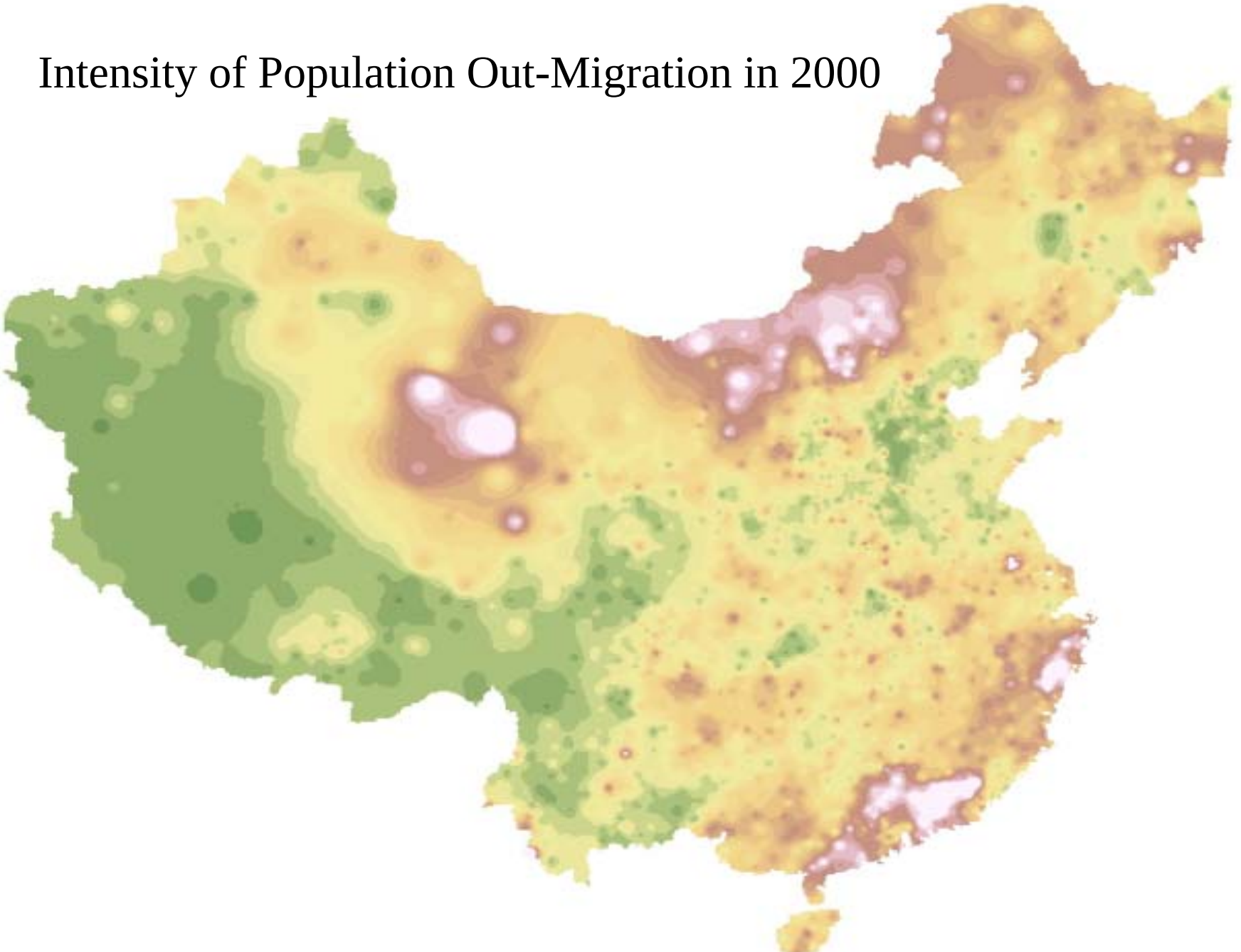


Intensity of Population Out-Migration in 2000



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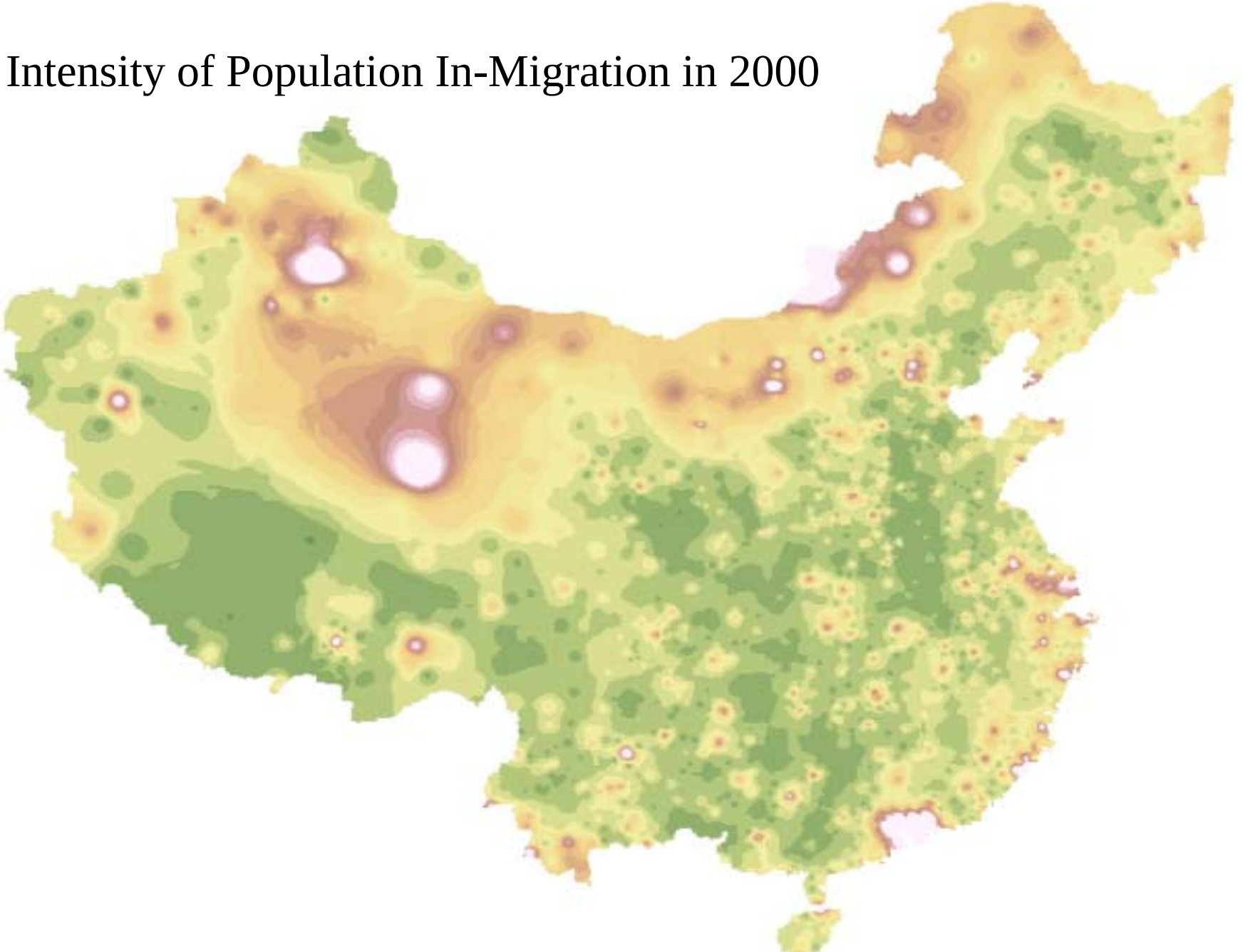

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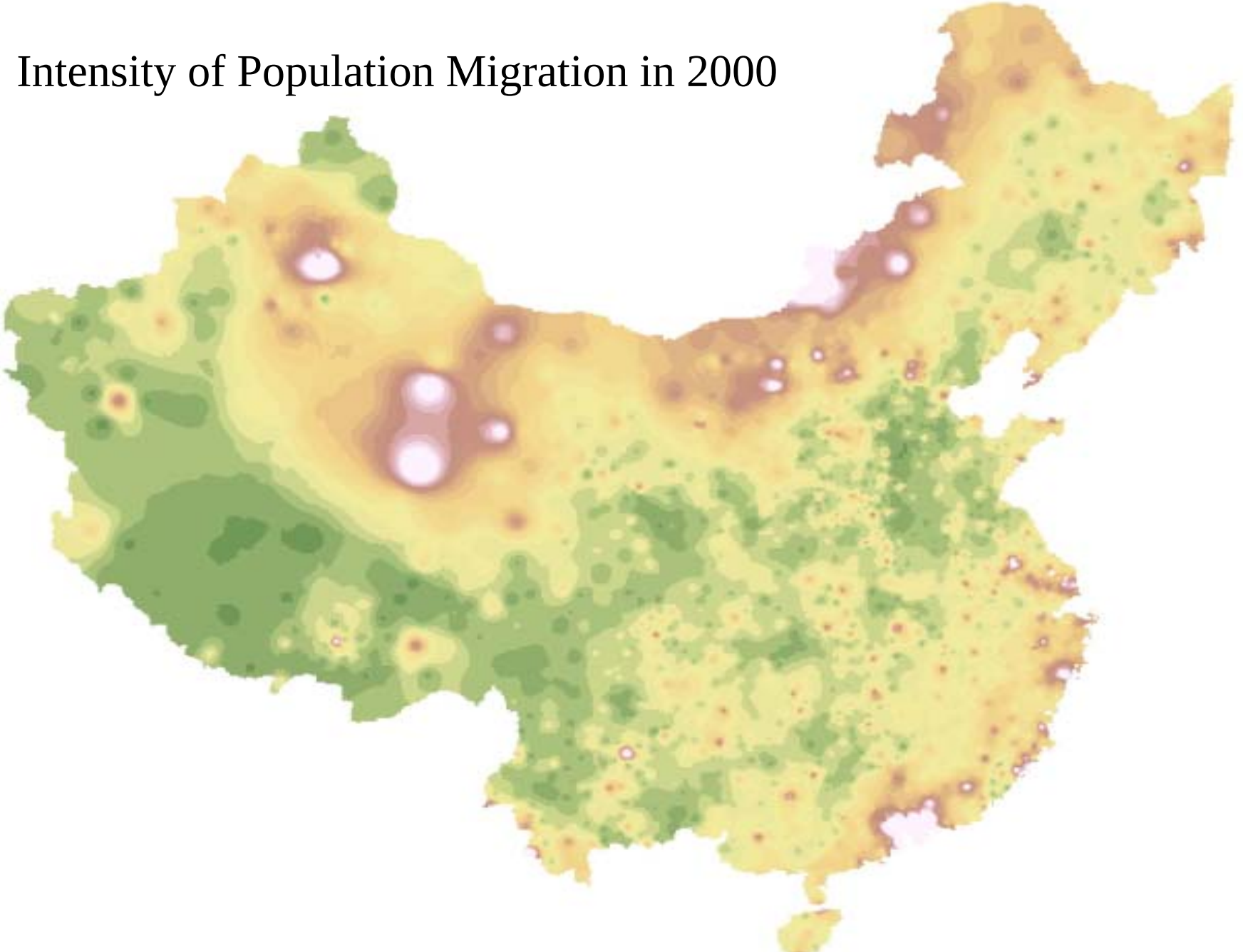

Counties with over 100% net in-migration

County Name	County Name in Pinyin	%
深圳市辖区	Shēn Zhèn Shì Xiá Qū	473.3
东莞市	Dōng Wǎn Shì	317.4
二连浩特市	Èr Lián Hào Tè Shì	140.4
乌鲁木齐县	Wū Lǔ Mù Qí Xiàn	125.2
珠海市辖区	Zhū Hǎi Shì Xiá Qū	117.9

Counties with over 30% net out-migration

County Name	County Name in Pinyin	%
紫金县	Zǐ Jīn Xiàn	-36.2
东源县	Dōng Yuán Xiàn	-36.0
德令哈市	Dé Lìng Hā Shì	-33.6
丰顺县	Fēng Shùn Xiàn	-32.1
大埔县	Dà Pǔ Xiàn	-31.6
龙川县	Lóng Chuān Xiàn	-31.4

3. Data Preparation and Analysis

The total net in-migration population in counties with over 40% net in-migration is 23,552,880, accounting for 1.9% of national total population.

The total net out-migration population in counties with over 10% net out-migration, accounting for 1.89% with a number of 276 counties (11.7% of total number of counties).

4. Conclusions

Population movement intensities is very high in China, it implicates strong tendency of urbanization and indicates that current statistical items do not reflect the actual social development level. Environment evaluations, planning for social infrastructure and policies formation must carefully taken into the consideration of population movement.

5. FURTHER WORKS

The further work is to locate the all population to each township, as each country in China holds an average area of 5000 km^2, some countries even is bigger than 300,000 km^2.

Comparison on Interpolation Methods for Air Temperature

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9th AIM International Workshop, March 11-15, NIES, Tsukuba, Japan, 2004

1. Introduction

Air temperature is one of the key attributes for heat resources analysis, natural regionalization and agricultural production potential calculation, etc. Commonly, temperature is observed in meteorological stations which generally distribute in some typical regions. However, the number of observation station is limited. How to estimate temperature values of rest area where has no meteorological stations has been paid much attention all the time.

2. Methods

(1) Direct interpolation

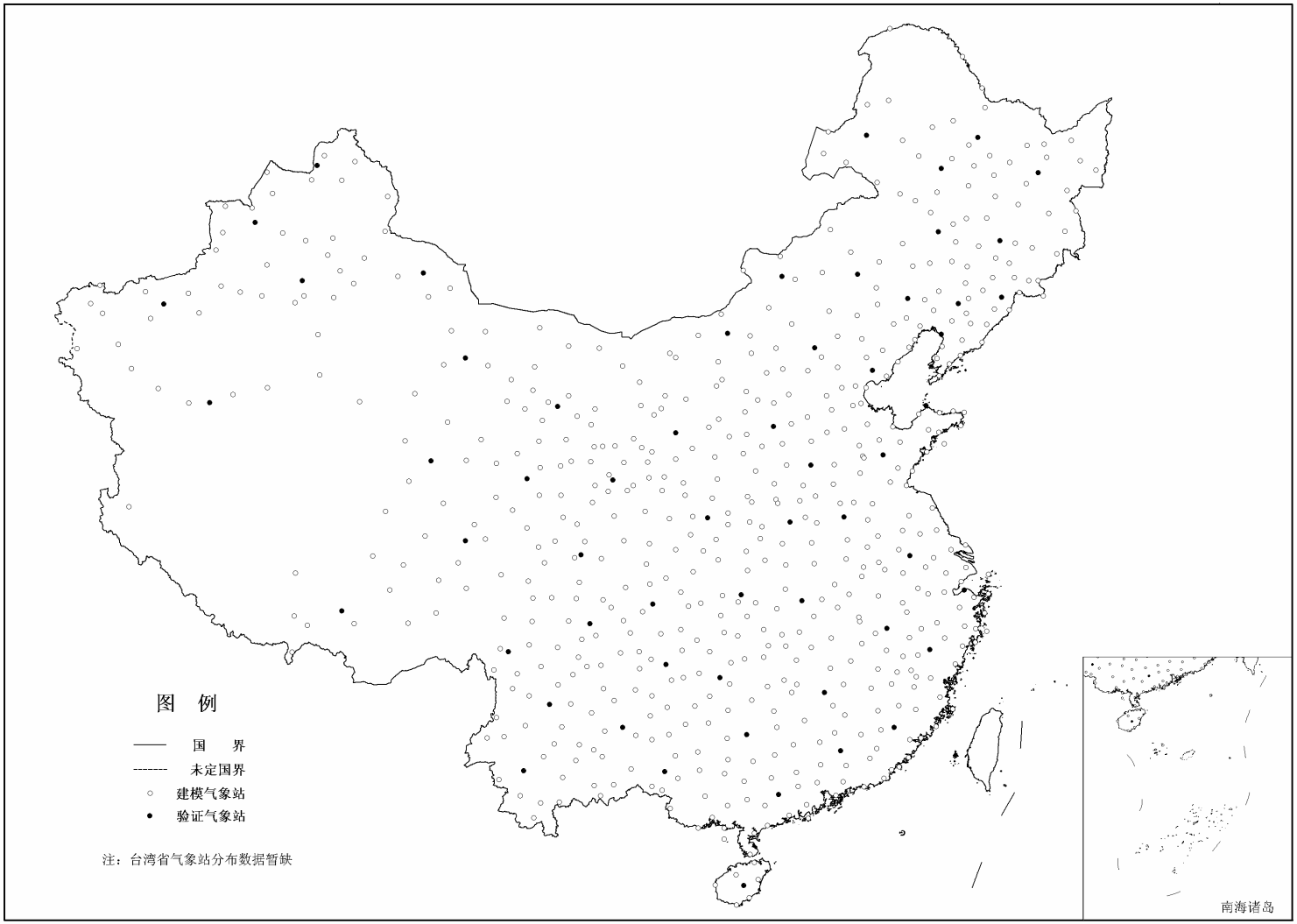
(2) Temperature-elevation model.

$$T_0 = T_h + 0.0065\,h$$

(3)Multiple variable regression model

- *T=f(latitude, longitude, altitude)*
- *Residual deviation (D) between T and observed temperature is interpolated by spline method without considering the influences of topography*
- $T_e = T + D$

Distribution of 58 stations for method verification



3. Methods Comparison

	Annual Temperature		January Temperature		July Temperature	
	r	STD	r	STD	r	STD
Direct interpolation	0.868	3.3	0.950	3.4	0.784	3.6
Temperature-elevation	0.981	1.3	0.977	2.4	0.973	1.1
Multiple variables regression	0.977	1.4	0.978	2.3	0.970	1.1

4. Conclusions

- Direct interpolation is not suitable for temperature estimation
- Temperature-elevation model and multiple variable regression model can be used for temperature estimation
- Temperature-elevation model is simple and easy to operate.

Thanks!