2011年10月 长沙

景观城市化过程及其影响模拟研究-微观机理与宏观要素的结合

何春阳

地表过程与资源生态国家重点实验室（北京师范大学）
北京师范大学资源学院，北京，100875
个人主页：http://irs.bnu.edu.cn/Faculty/HeCY/
Email: hcy@bnu.edu.cn

北京師範大學
Beijing Normal University
地表过程与资源生态国家重点实验室
State Key Laboratory of Earth Surface Processes and Resource Ecology

报告提纲

第一部分：景观城市化过程与影响

第二部分：景观城市化模拟的原理和方法

第三部分：景观城市化模拟的新思路与进展

第四部分：景观城市化模拟的趋势

城市化

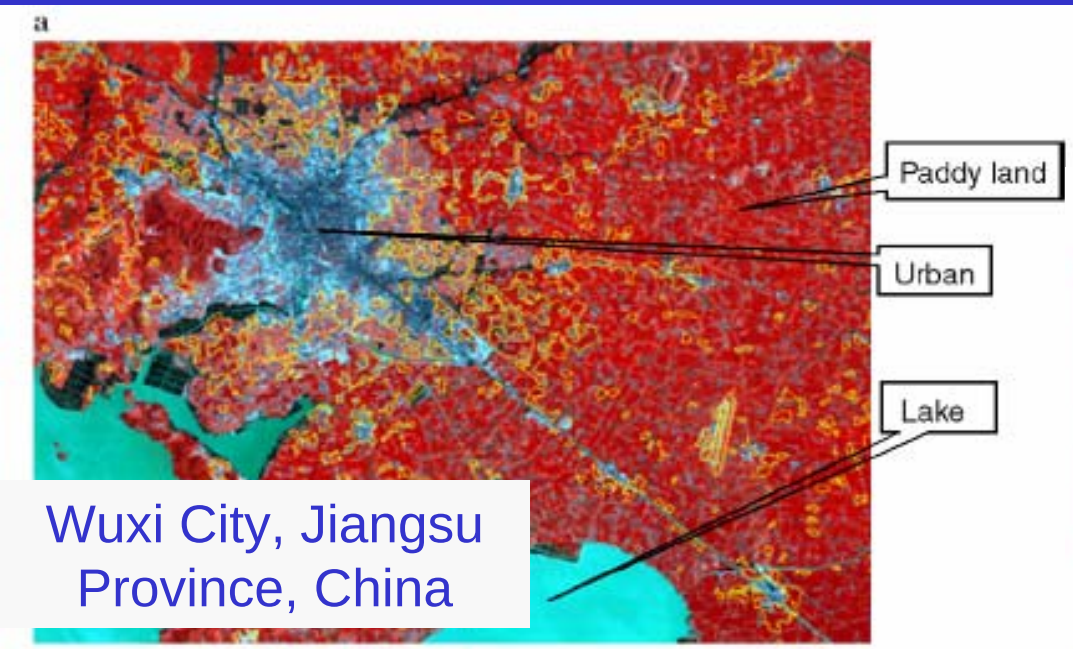
城市化：人类生产与生活方式由农村型向城市型转化的历史过程，主要表现为农村人口转化为城市人口及城市不断发展完善的过程。（《中华人民共和国国家标准城市规划术语》）

- 农业人口转化为非农业人口
- 农业活动转化为非农业活动
- 农村价值观念转化为城市价值观念
- 农村生活方式转化为城市生活方式
- 农村地域转化为城市地域

人口城市化；经济城市化；社会城市化；空间城市化

景观城市化

景观城市化主要指由于土地利用方式的变化，导致空间上城市规模扩大，发生景观意义上的土地系统变化过程。建设用地占用农业用地与生态用地蔓延扩展是中国景观城市化中土地利用方式变化的基本特征。



Wuxi City, Jiangsu Province, China

LANDSAT-5 Thematic Mapper (TM) image. Date: Nov. 13, 1988. Source: Liu et al. 2005

LANDSAT-7 Enhanced Thematic Mapper Plus (ETM+) image. Date: May. 4, 2000.

景观城市化的物理效应与风险

表 3-19　不同地表状况下形成的地表径流占降水量的平均比例

地　表　性　质	地表径流占降水量的平均比例（%）
屋　　顶	100
水泥、沥青和接缝处被胶结的石子路面	90
接缝处未被胶结的石子路面	80
铺以矿渣的人行道	60
未铺石子的道路、广场和林荫道	50
运　动　场	25
花　园（小~大）	10~15
公　　园	0~5

城市水文效应和水灾

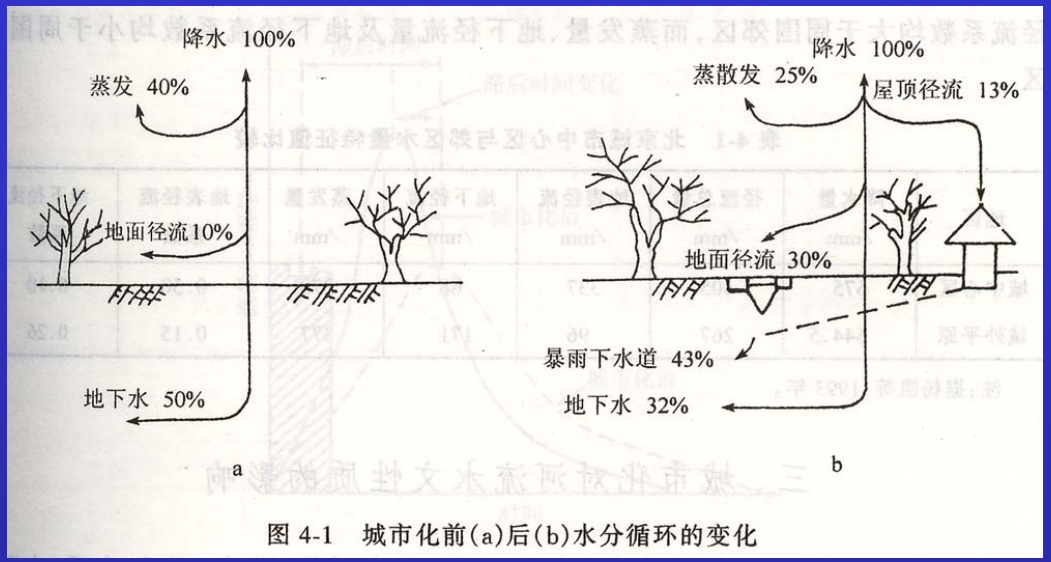


图 4-1　城市化前(a)后(b)水分循环的变化

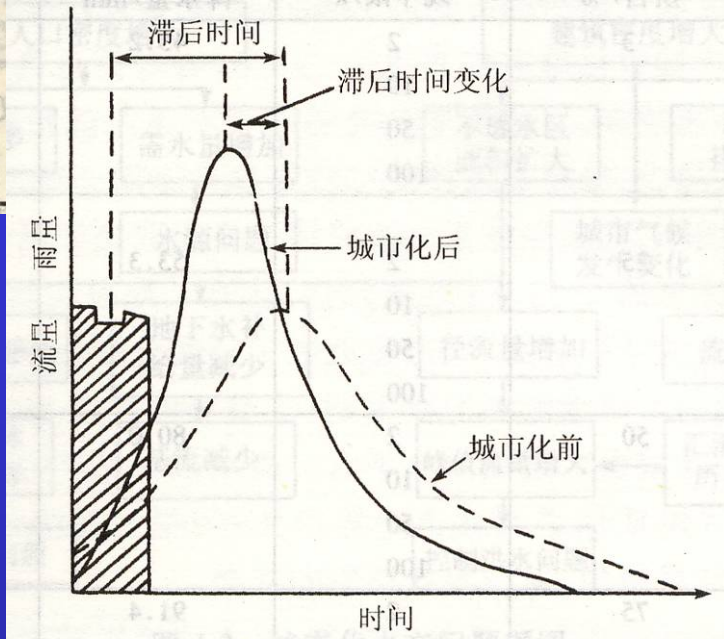


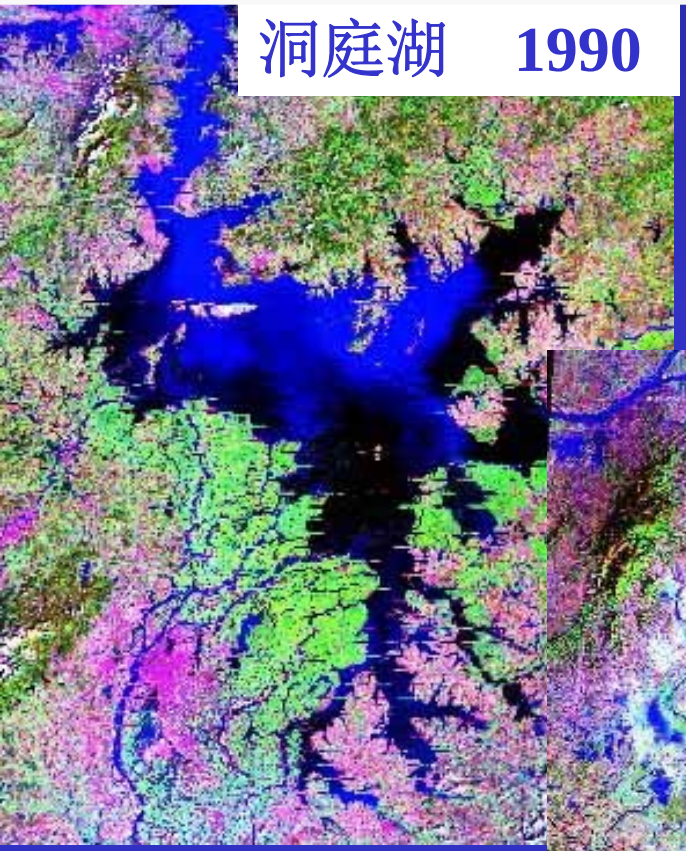
图 4-2　城市化前后流量过程线的变化

物理作用-城市热岛、城市洪水、地面沉降

景观城市化的化学效应与风险

化学反应-土壤重金属污染、大气污染、地下水污染

景观城市化的生态效应与风险



洞庭湖　1990

栖息地破坏

生物多样性损失

洞庭湖　2007

城市扩展

湿地萎缩

生态系统变异-生境破坏、生态系统功能损失

What's the role of the urban expansion at the global scales?

Source: Lambina & Meyfroidt, 2011, Global land use change, economic globalization, and the looming land scarcity, PANS, 2011, March, 1.

Table 1. Estimates of land use in 2000 and additional land demand for 2030

Land use category	Low, Mha	High, Mha
Land use in 2000		
Cropland	1,510	1,611
Pastures	2,500	3,410
Natural forests	3,143	3,871
Planted forests	126	215
Urban built-up area	66	351
Unused, productive land	356	445
Projected land use for 2030		
Additional cropland	81	147
Additional biofuel crops	44	118
Additional grazing land	0	151
Urban expansion	48	100
Expansion industrial forestry	56	109
Expansion of protected areas	26	80
Land lost to land degradation	30	87
Total land demand for 2030	285	792
Balance (unused land in 2000 – land demand in 2030)		
With no deforestation	+71	–347
Clearing of natural forests	152	303
With deforestation	+223	–44

These values were derived from the literature and selected based on an expert judgment, evaluating the realism of underlying assumptions, looking for a convergence of evidence, and using 2000–2010 observations as a reality check (references and explanations in *SI Text*). The low estimates represent a conservative view of both land reserve and additional land demand, whereas the high estimates represent a slightly bolder view.

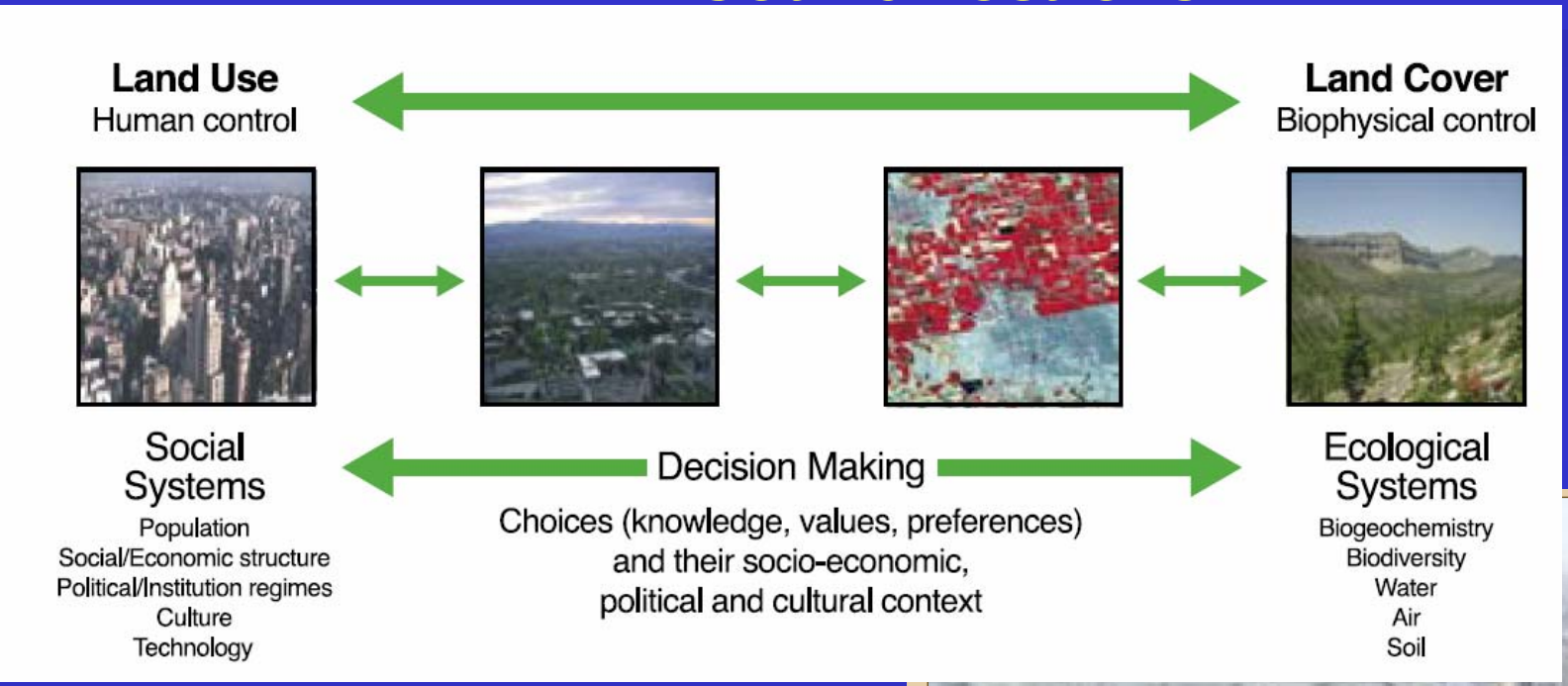
Contributed by Eric F. Lambin, January 18, 2011 (sent for review November 21, 2010)

: globalization,

h and Life Institute, Georges Lemaître Centre for Earth and

cademy of Sciences elected in 2009.

Peri-urban areas are a key interface between urban and rural areas due to the provision of essential services in both directions



Source: Global Land Project, pp.4, IGBP Report 53/ IHDP Report 19, 2005

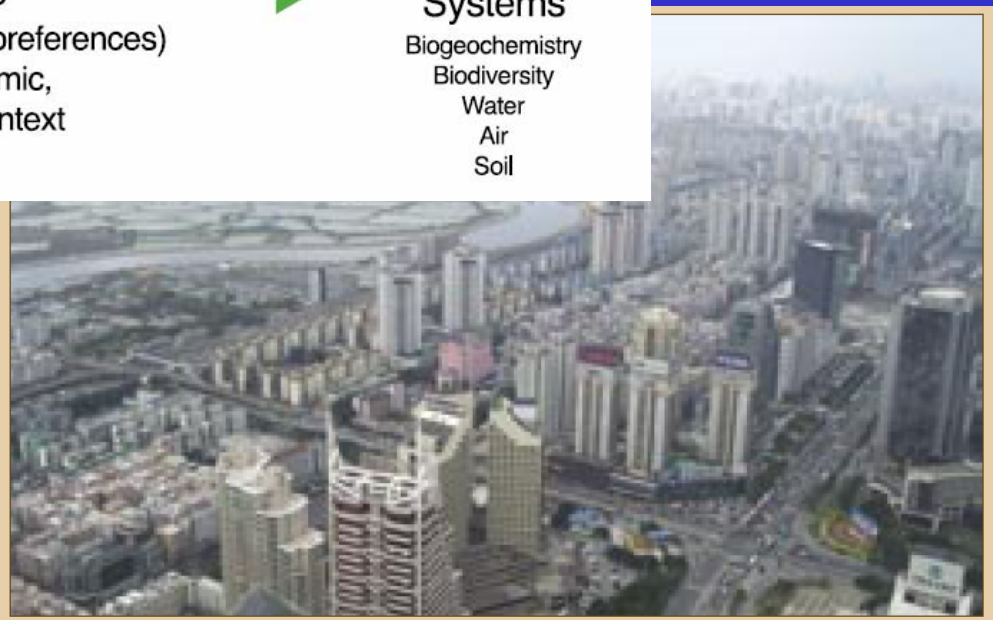


Figure 7. The urban-rural interface in Shenzhen, China.

中国景观城市化基本特点1: 动力强劲

叶嘉安院士等（2006）指出中国正进入加速城市化的第四波

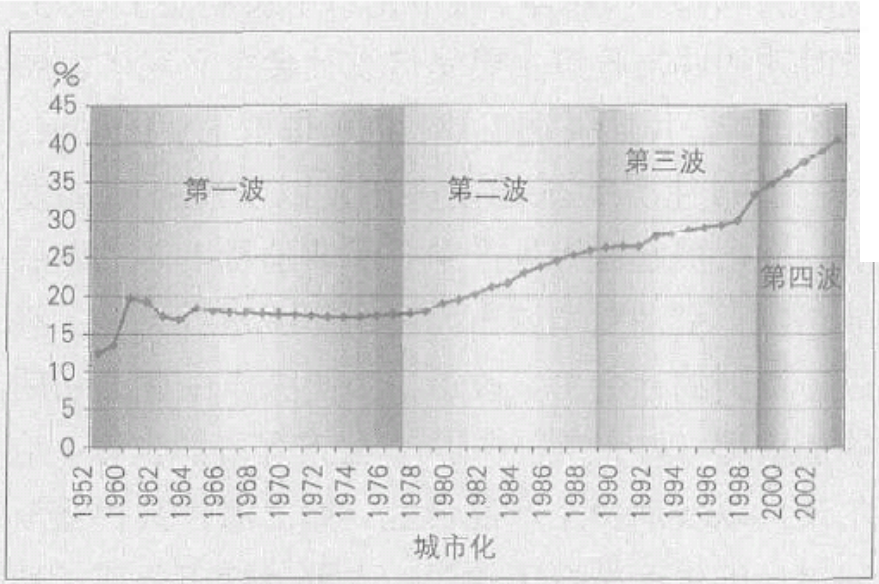


图 1　建国以来我国城市化历程曲线　（1952–2002）

Fig.1 Four waves of urbanization in China (1952-2003)

资料来源：中国统计年鉴，历年。

表 1-1　世界城市人口增长状况

项目 \ 年代	1900	1920	1950	1960	1970	1980	1990	2000	2010
城市人口/亿	1.6	2.5	7.34	10.32	23.71	17.64	22.6	28.54	36.23
占总人口/%	10	13.6	29.2	34.2	37.1	39.6	42.7	46.6	51.8

表 1-2　我国城市人口增长状况

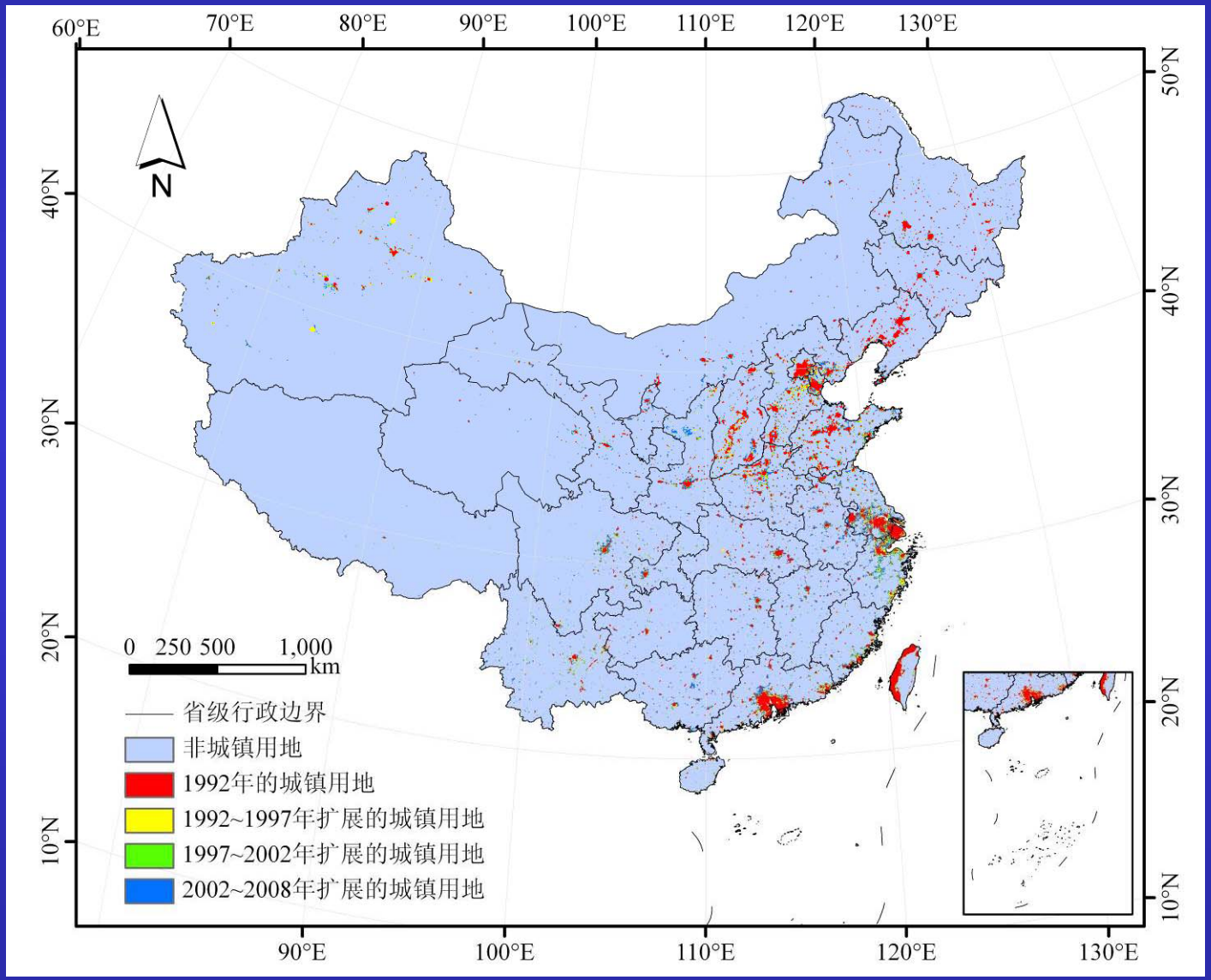
项目 \ 年代	1952	1970	1980	1984	1987	1990	1993	1995	2000	2010
城市人口/亿	0.39	0.93	1.34	1.91	2.62	2.97	3.21	3.48	3.87	4.71
占总人口/%	8.3	11.2	13.6	18.6	24.3	26.2	28.6	28.8	29.03	32.94

注：据城市统计年鉴。

吴良镛院士（2003）指出，在今后25年，中国城市化率将从1999年的30.9%增长到2025年的55%左右，城市人口从1999年的3.89亿增加到2025年的8.3亿～8.7亿，翻一番以上。

规模大！速度快！　势头猛！今后20年相当于在对日本和美国的总人口进行整体迁移。

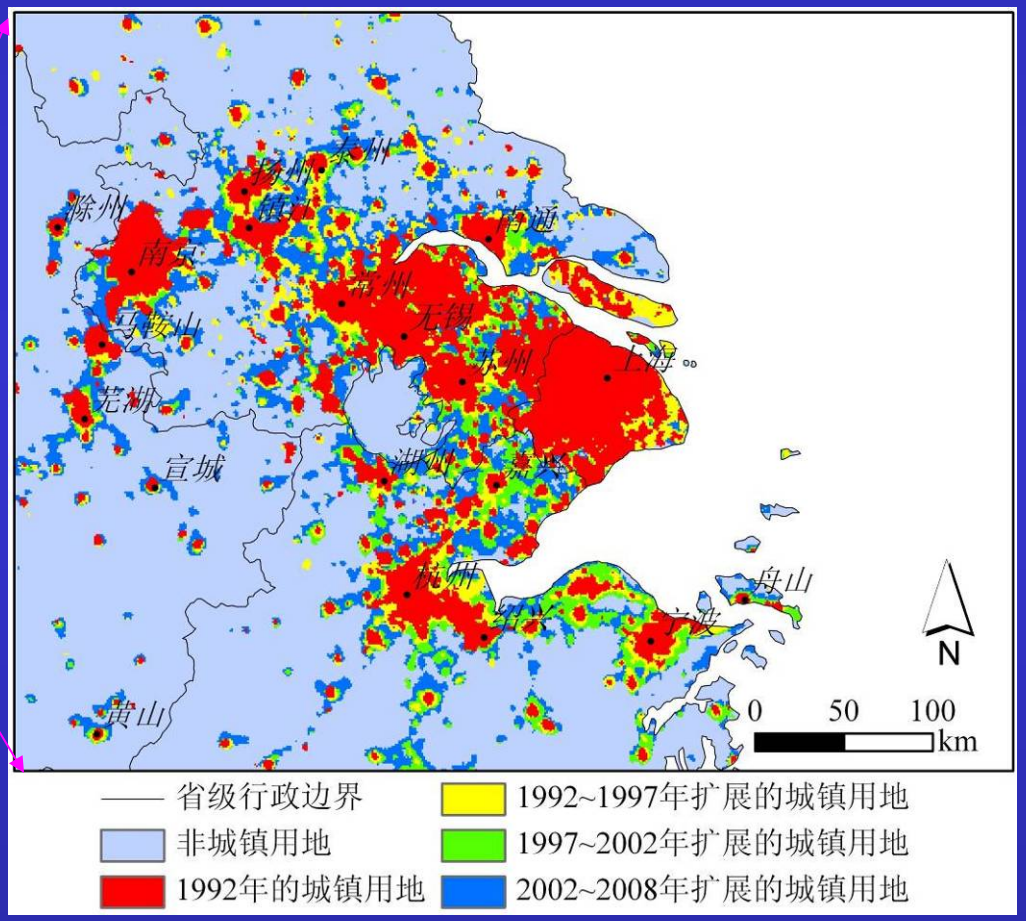
中国景观城市化特点2: 以空间蔓延扩展为主



1992–2008年中国城镇用地空间扩展过程

景观城市化过程明显

1992-2008年沪宁杭城市群城镇用地扩展过程



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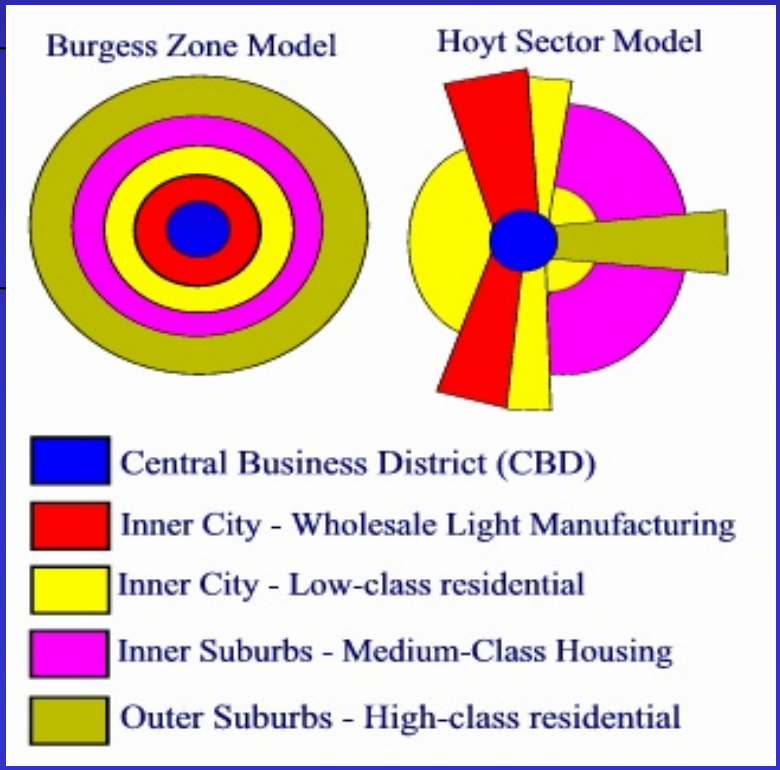
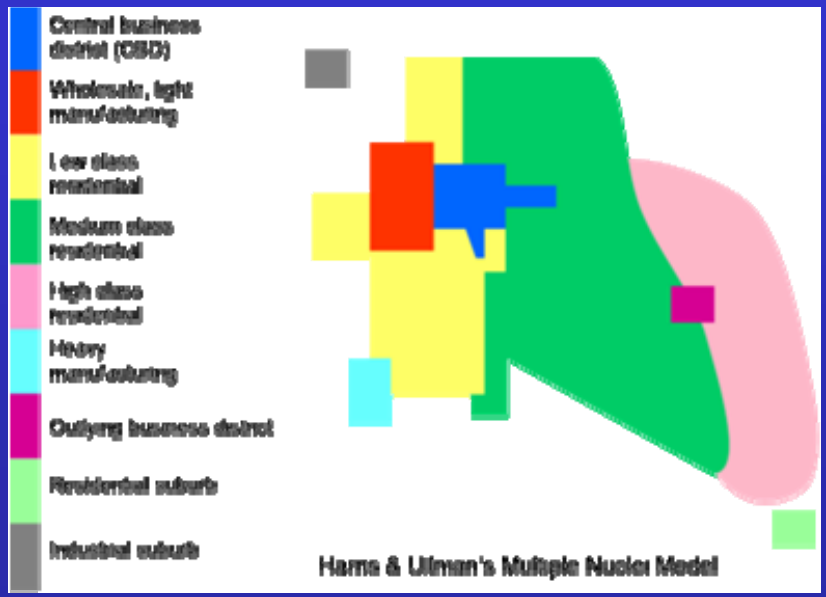
Early Theories

- *Concentric ring model (Burgess, 1925)*
- *Sector model (Hoyt, 1939)*
- *Multiple nuclei model (Harris and Ullman, 1945)*
- *Contrifugal forces* and *centripetal forces (Colby, 1933)*





定性概念模型

Approach History (1)

1960

Equation models
e.g. Gravity model
Lowry model (Lowry, 1964)

$$T_{ij} = G \times P_i P_j / d_{ij}^2$$

$$T_{ij} = a \times P_i P_j / C_{ij}^b$$

- Pros
  - Simple
  - More despritive than theoretical model

- Cons
  - Lacking underlying theory
  - Hard to get the solution to some models

定量数学模型

Approach History (2)

1960 → 1970

Requiem for large-scale models
(Lee, 1973)

- Urban areas and urban systems were complicated, expensive, and lacking an underlying theoretical base
- Models are too coarse for urban planners but still required vast amounts of data
- There was a discrepancy between the claimed behaviors and the equations used

微分方程模型

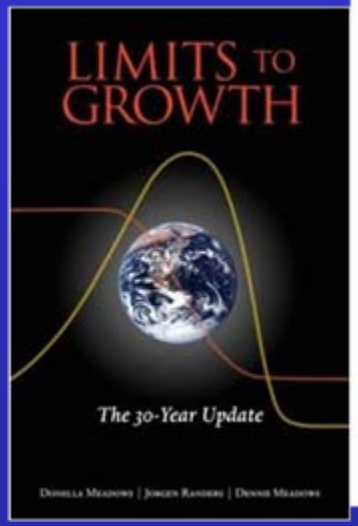
Approach History (3)

1960 → 1970 → 1980

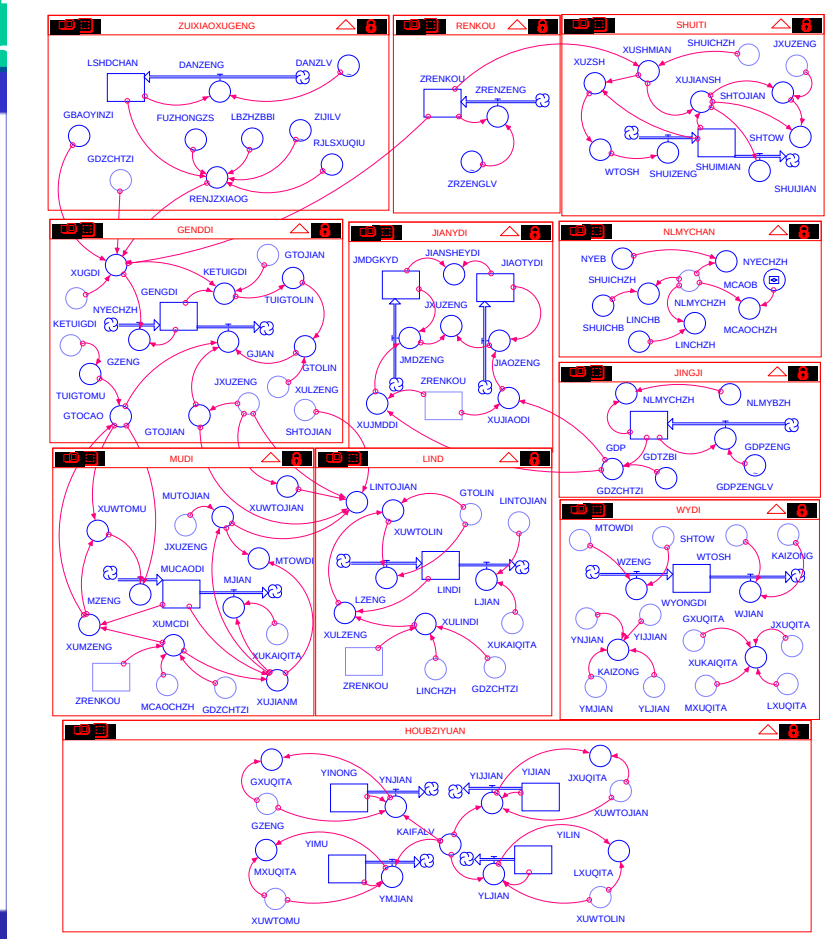
系统动力学模型

System dynamic (SD) m

Stella



- ***Founder***
  - *Jay W. Forrester, MIT System Dynamics Group*
- ***Limits to Growth, 1972***
  - *modeling the consequences of a rapidly growing world population and finite resource supplies, commissioned by the Club of Rome.*

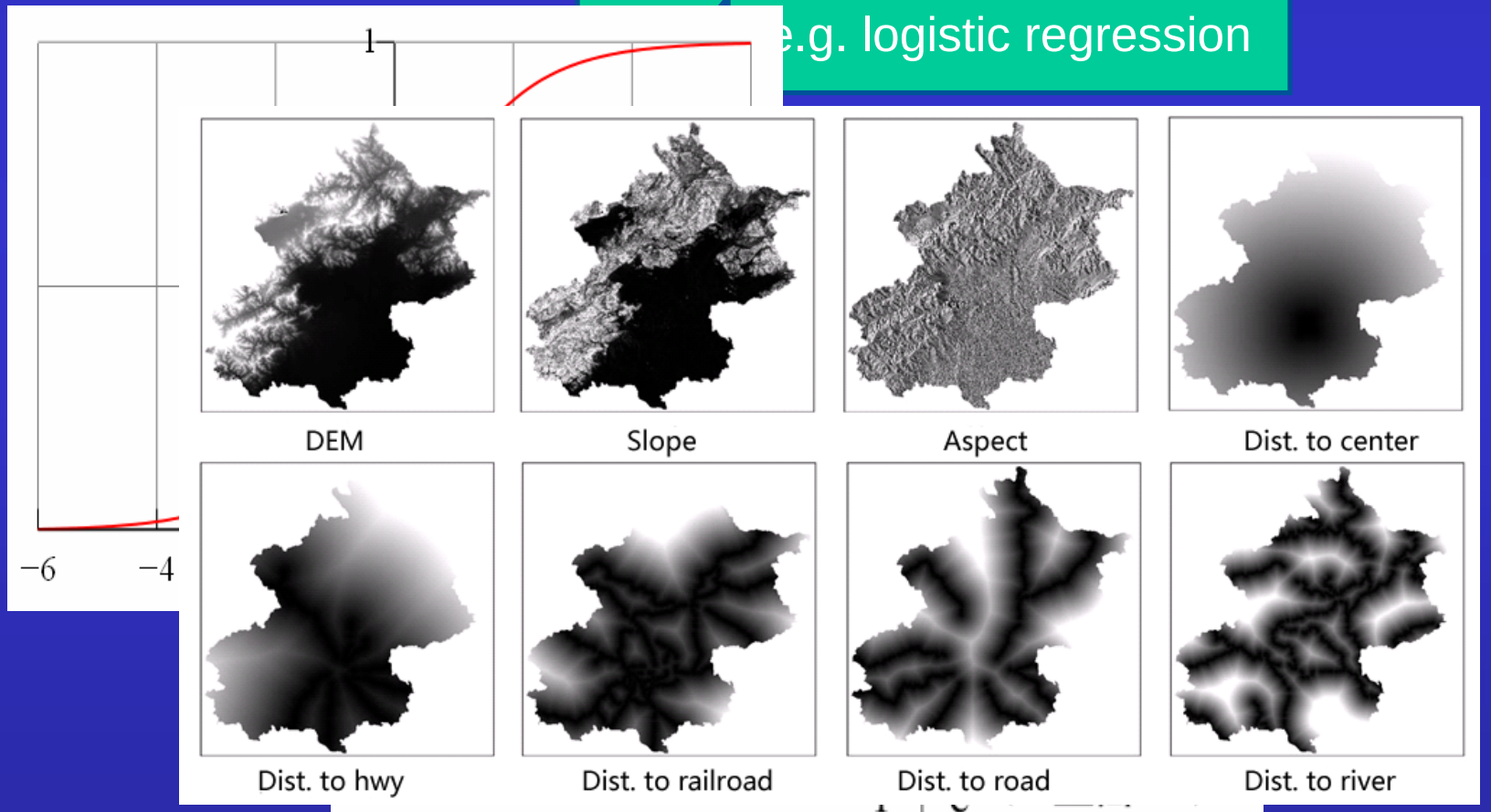


Approach History (4)

1960 → 1970 → 1980

空间统计学模型

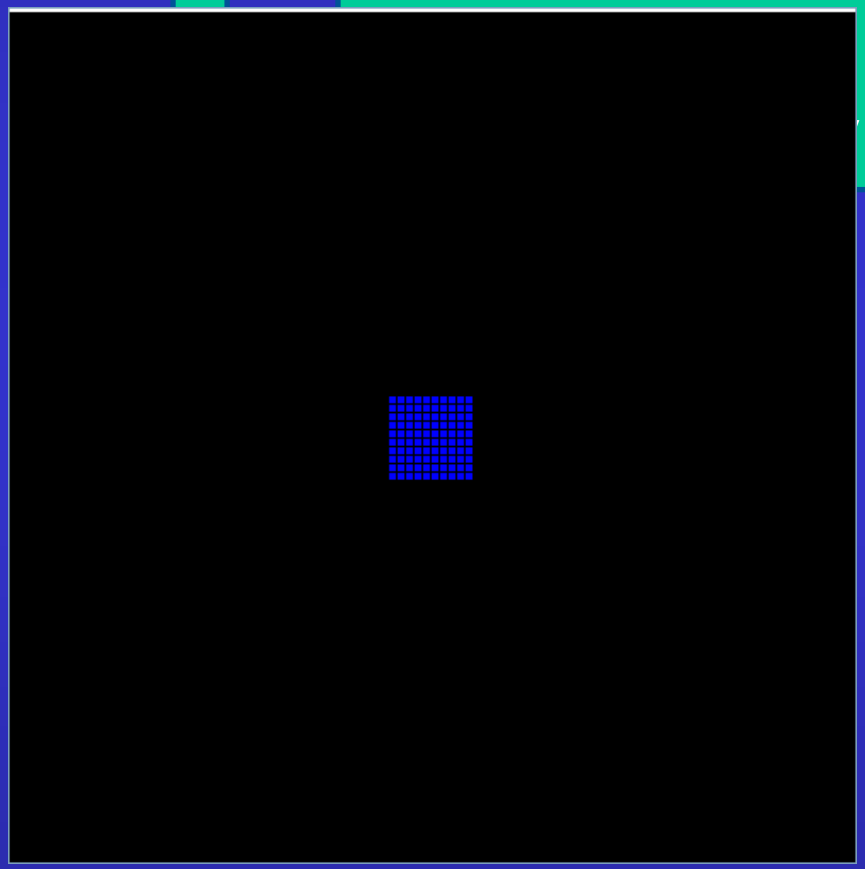
Statisical model
e.g. logistic regression



Approach History (4)

1960 1970 1980 1990

- CA
  - grid space + automaton
  - change with regard to internal state, rules, and external neighboring
- *Game of Life*
  - Die (underpopulation): with fewer than 2 live neighbours
  - Die (overcrowding): with more than 3 live neighbours dies
  - Stay alive: with 2 or 3 live neighbours
  - Become alive: with exactly 3 live neighbours



Simulated by repast 30 steps

Approach History (4)

- Pros
  - non-linear
  - non-equilibrium human-environment interactions
  - Consider neighboring effect
- Cons
  - Cell cannot move
  - Cannot represent human behavior
  - Restricted neighborhood effect
  - Hard to define transitional rules

Approach History (5)

1960 1970 1980 1990 2000

宏观–微观–个体

Agent based model

TABLE 3 Properties of Agents in ABM/MAS

Property	Other names	Meaning
Autonomous		Exercises control over its own actions
Heterogeneous		With different states and/or behaviors
Reactive	Sensing and acting	Responds in a timely fashion to changes in the environment
Goal-oriented	Proactive, purposeful	Does not simply act in response the environment
Synchronous	Temporally continuous	Agent behavior is a continuously running process
Asynchronous		Agent behavior is scheduled with specific order
Communicative	Socially able	Communicates with others agents, perhaps including people
Mobile		Able to transport itself from one location to another
Flexible		Agent actions are not scripted
Learning	Adaptive	Changes its behavior based on its previous experience
Bounded rationality		limits on the amount of effort agents use to search for and/or evaluate alternatives
Character		Believable 'personally' and emotional state

(Adapted from (Franklin and Graesser 1996)

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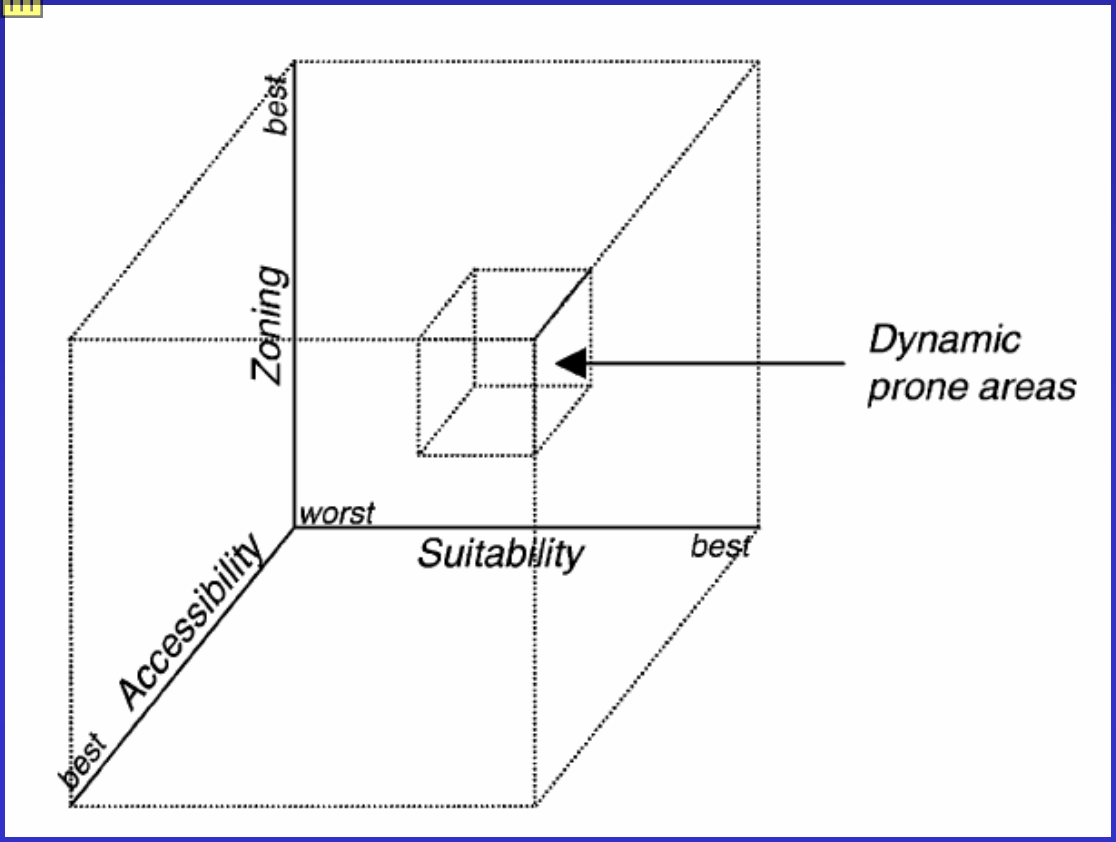
微观机理与宏观要素综合的景观城市化模型



Three-dimensional representation of the factors which actuate in urban land use dynamics in phase 1. (Barredo, et al., 2003)

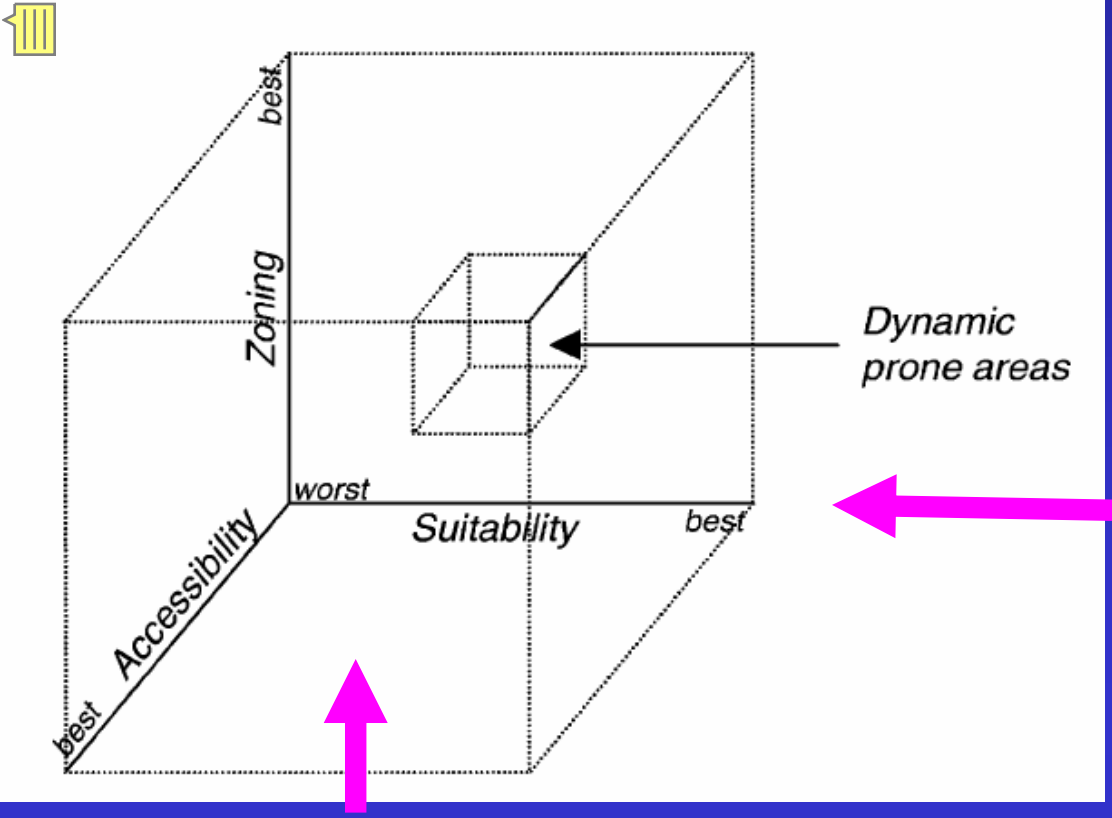
新思路：景观城市化过程是一个微观机理与宏观要素综合作用的过程

Wuxi City, Jiangsu Province, China

LANDSAT-5 Thematic Mapper (TM) image. Date: Nov. 13, 1988. Source: Liu et al. 2005

LANDSAT-7 Enhanced Thematic Mapper Plus (ETM+) image. Date: May. 4, 2000.

什么是微观机理与宏观要素？



微观机理： 微观的城市单元演化的基本规律（成本与收益）

* 聚集规律–规模效益–资本和产业

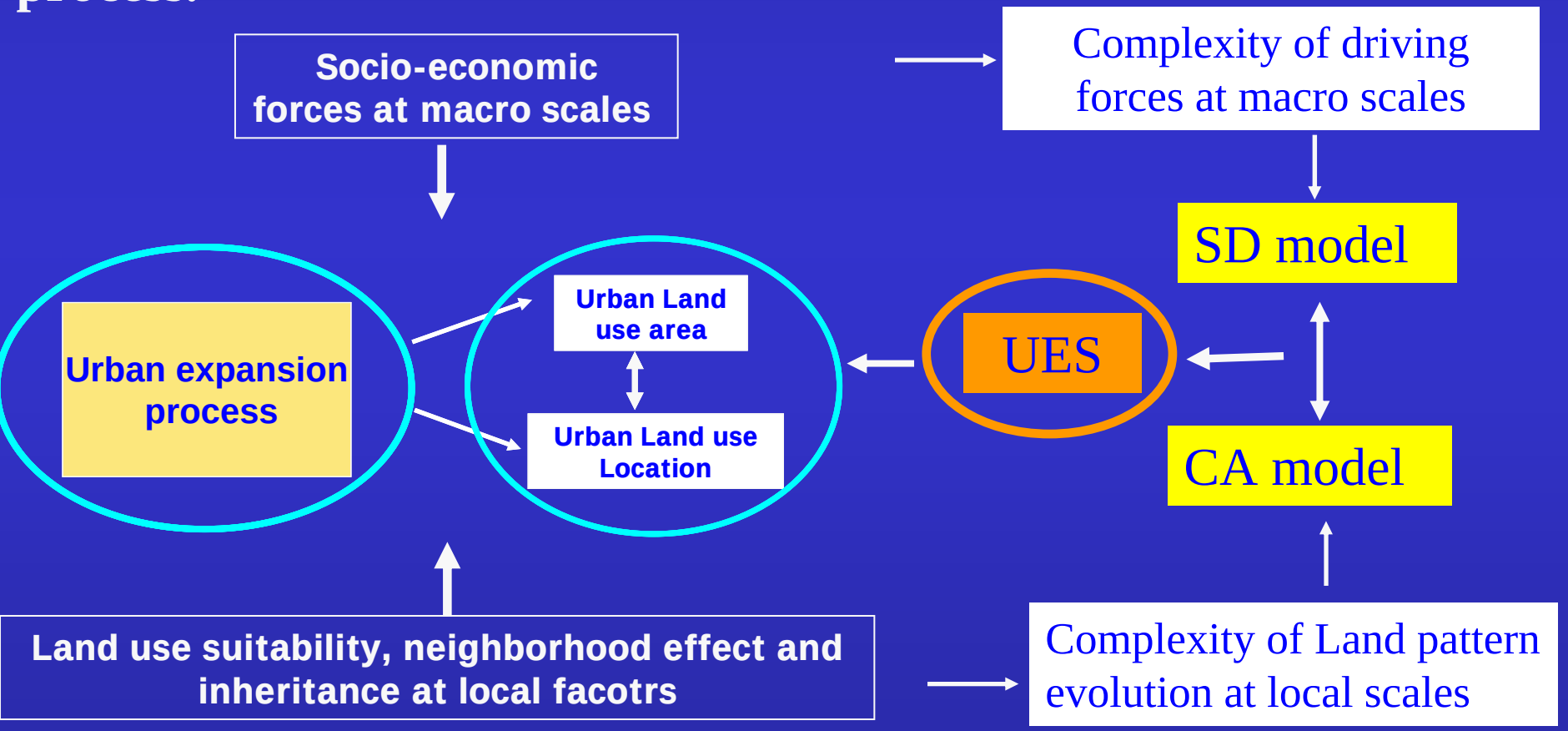
* 扩散规律–规模不经济的被动扩散；市场开拓下的主动扩散

宏观要素： 城市用地的总量需求变化过程。

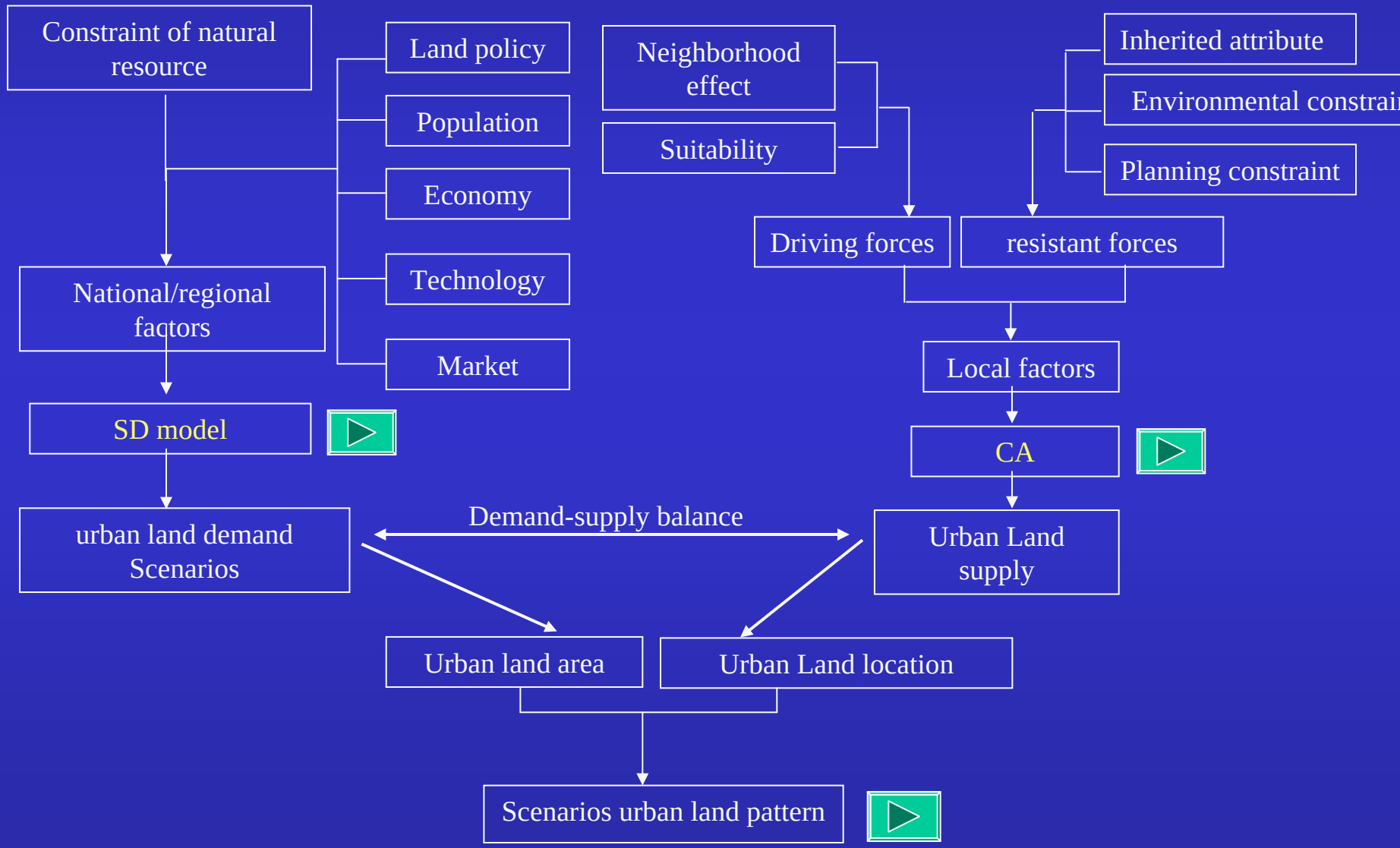
- 国家战略与区域规划
- 人口与经济规模
- 资源环境承载能力

Basic ideas of UES

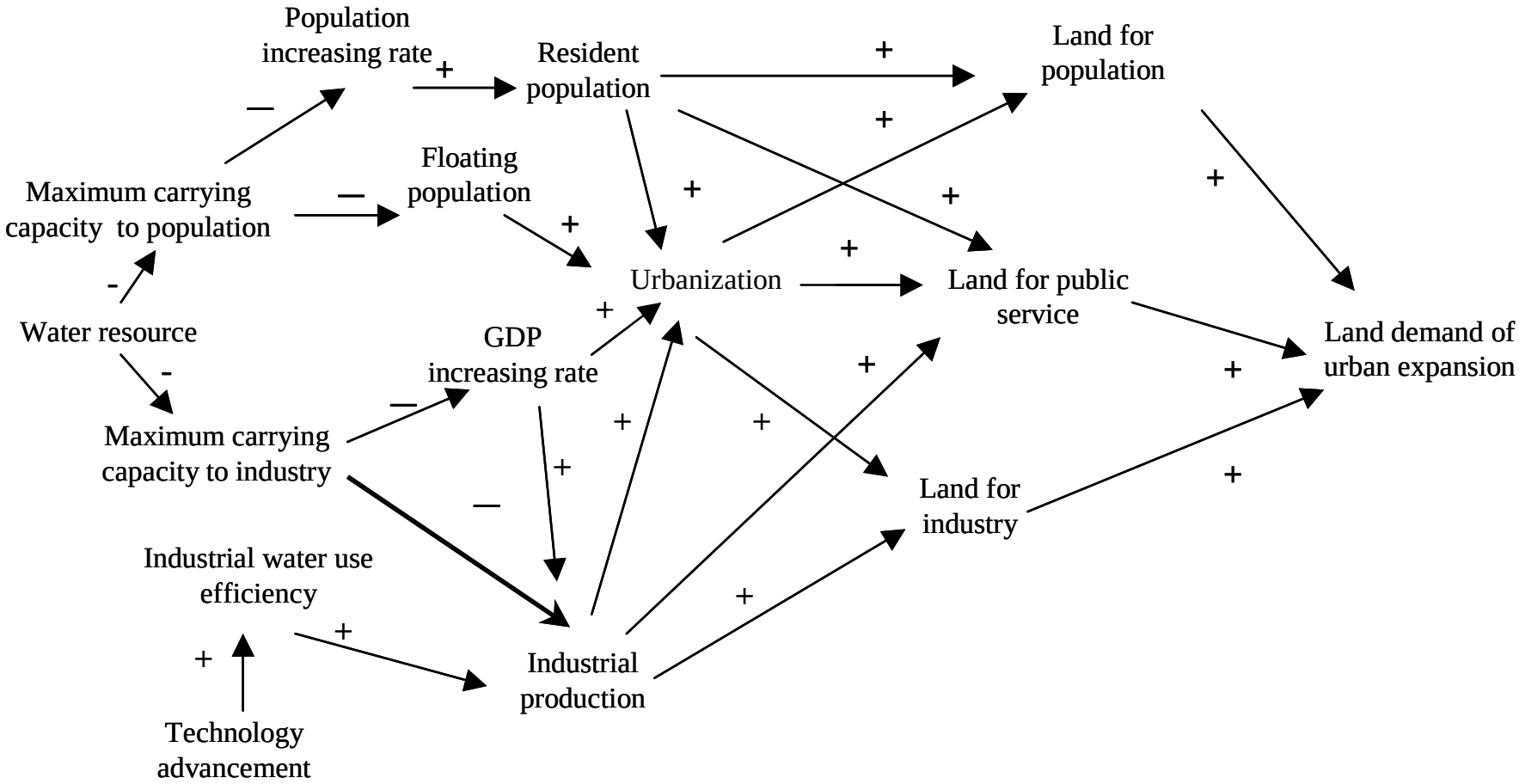
The basic idea of UES is to couple system dynamics (SD) model and CA (Cellular automata) model to represent the urban expansion process.



The general structure of UES



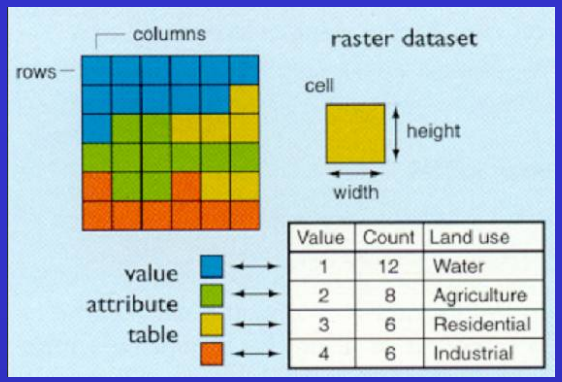
The urban land demand scenario module based on a SD model



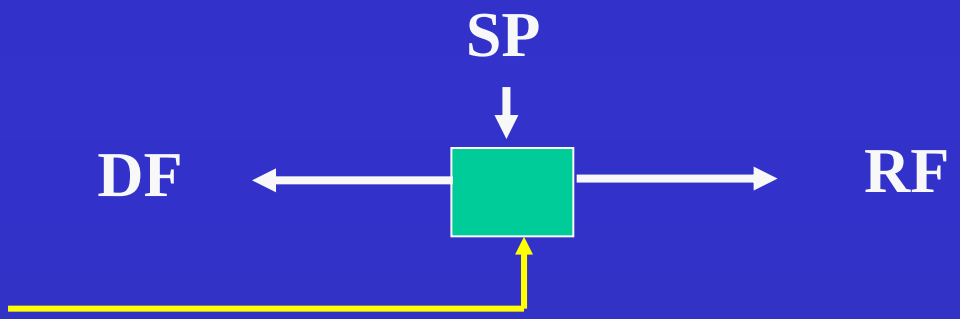
Framework of land use SD model

The urban land allocation module based on a CA model

The probability that cell *(x,y)* with land use type *K* is occupied by urban expansion at time *t* , is a function of the driving forces , the resistant forces and a stochastic perturbation . It can be expressed as:



Value	Count	Land use
1	12	Water
2	8	Agriculture
3	6	Residential
4	6	Industrial



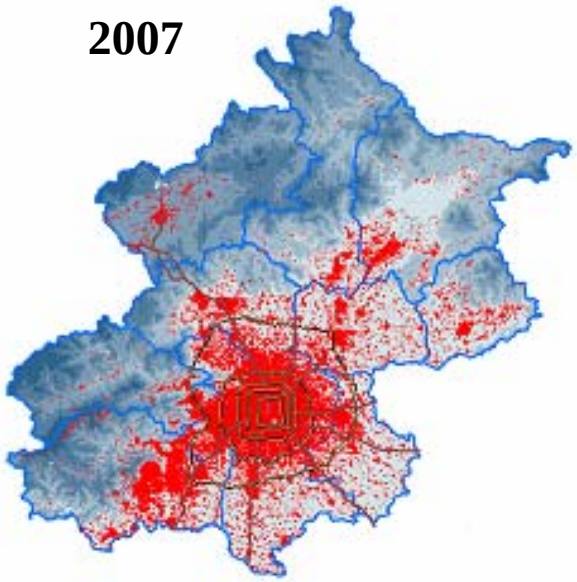
$$ {}^{t}P_{K,x,y} = f({}^{t}D_{x,y}, {}^{t}R_{x,y}, {}^{t}V_{x,y}) \qquad (3) $$

Driving Forces (DF)

Resistant Forces (RF)

Stochastic Perturbation (SP)

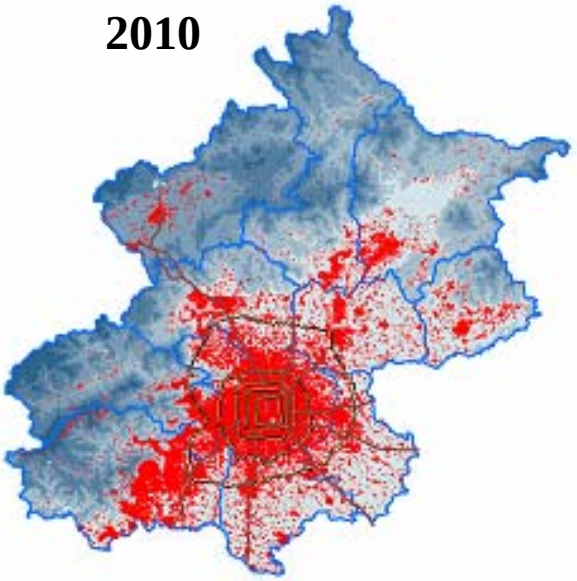
2007



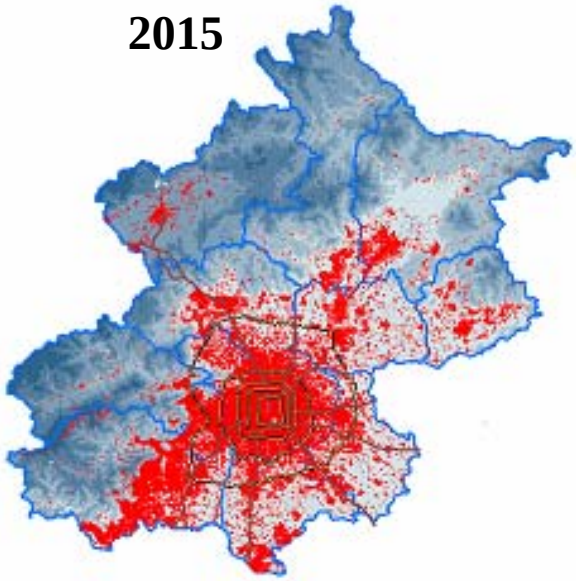
实现了对北京地区不同规划政策和资源约束情景下城市扩展过程的成功模拟。

Expressway
Ringroad
Administrative boundary
0 - 184 m
184 – 441 m
441 - 717 m
717 - 1075 m
1075 - 2219 m
Urban area
0 40 Kilometers

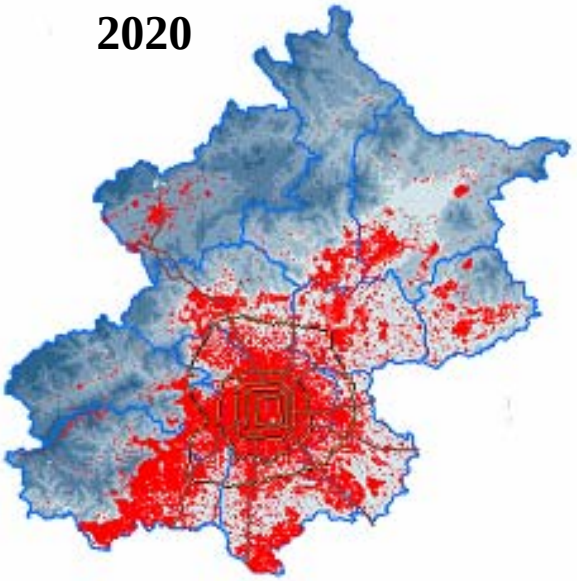
2010



2015

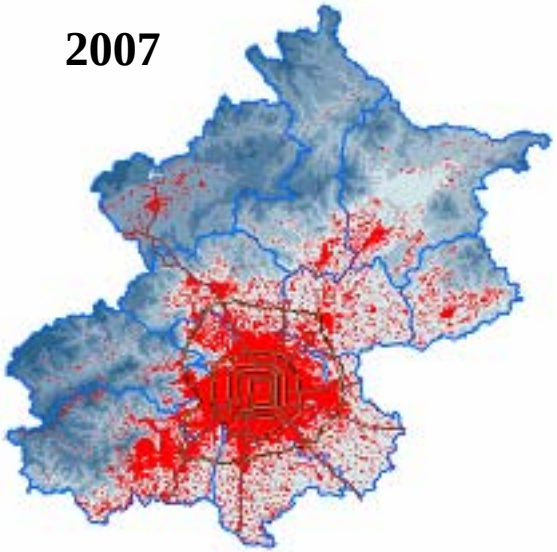


2020



Urban expansion scenario in Beijing from 2007 to 2020 under the restriction of high-yield farmland protection area

2007



Expressway
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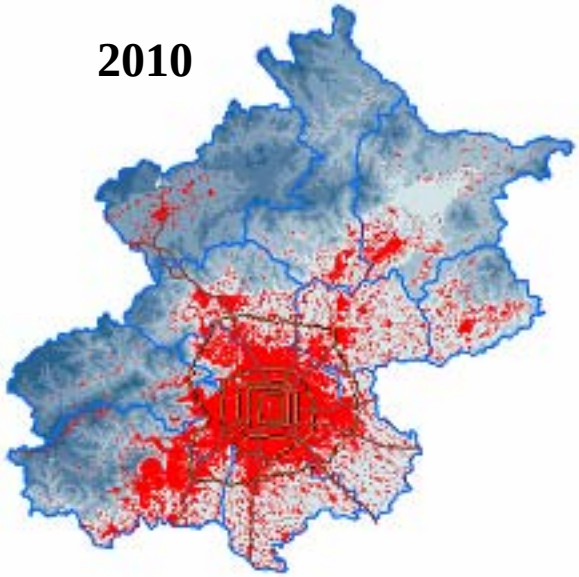
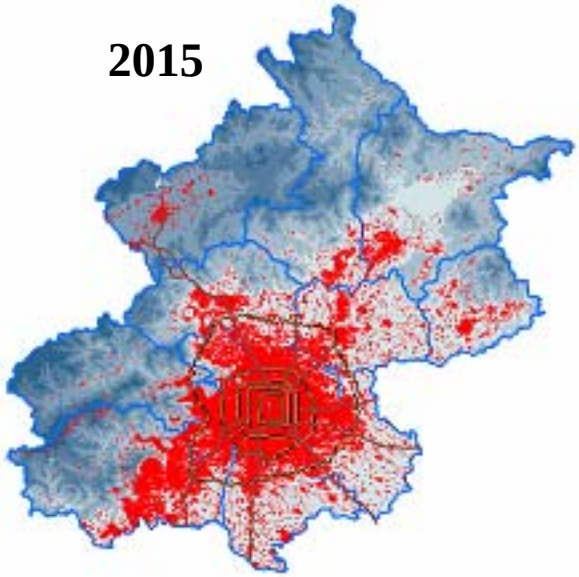
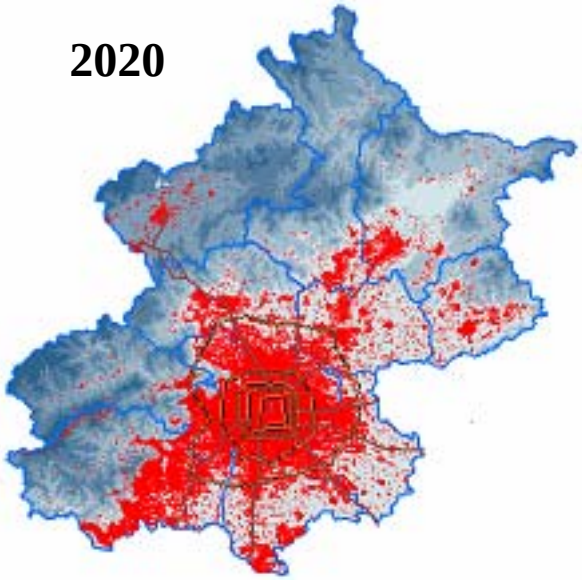


2015

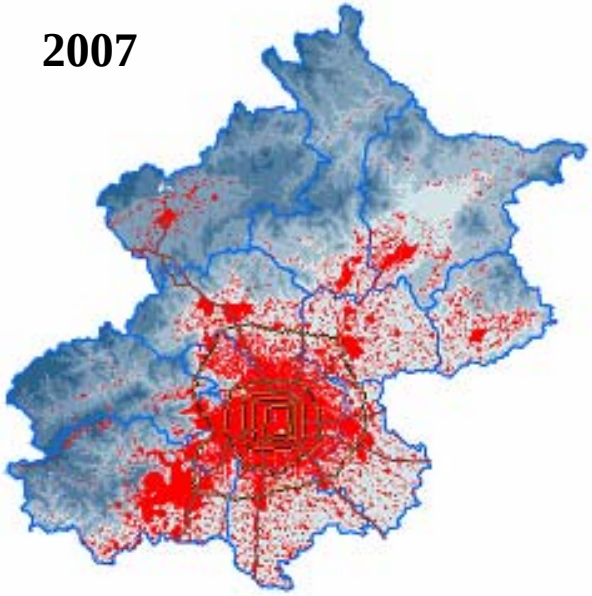


2020



Urban expansion scenario in Beijing from 2007 to 2020 under the restriction of the “green belt”

2007

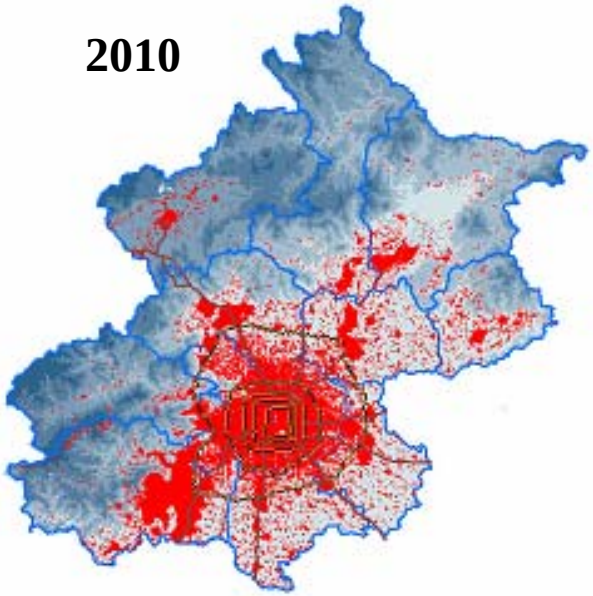


Expressway Ringroad Administrative boundary

0 - 184 m 184 – 441 m 441 - 717 m 717 - 1075 m

1075 - 2219 m Urban area N 0 40 Kilometers

2010



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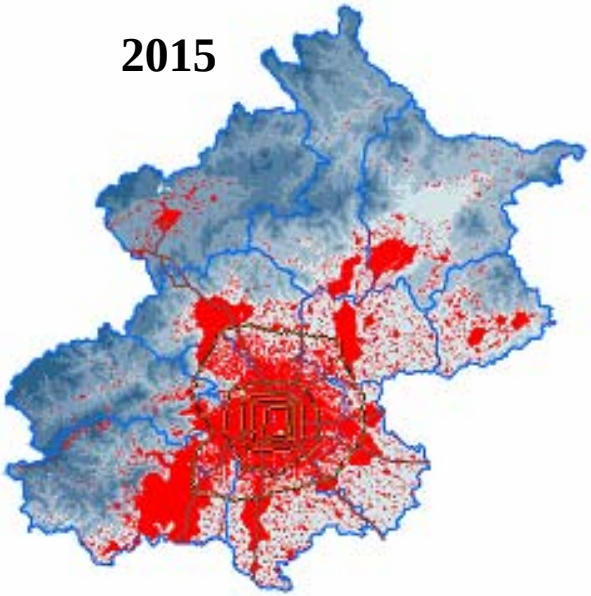
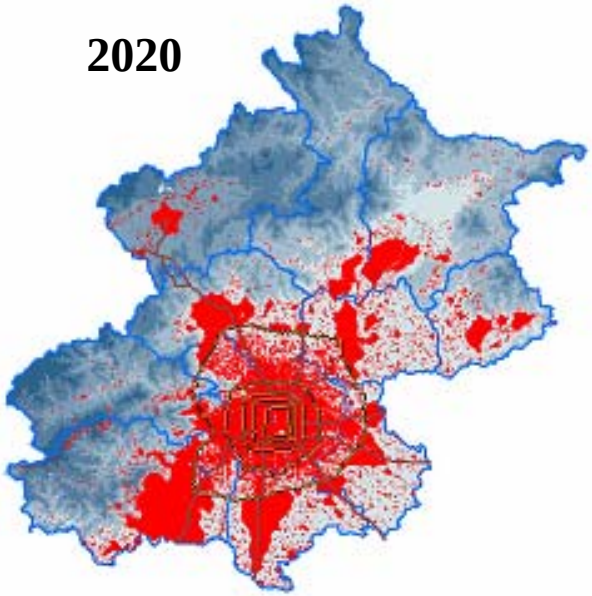
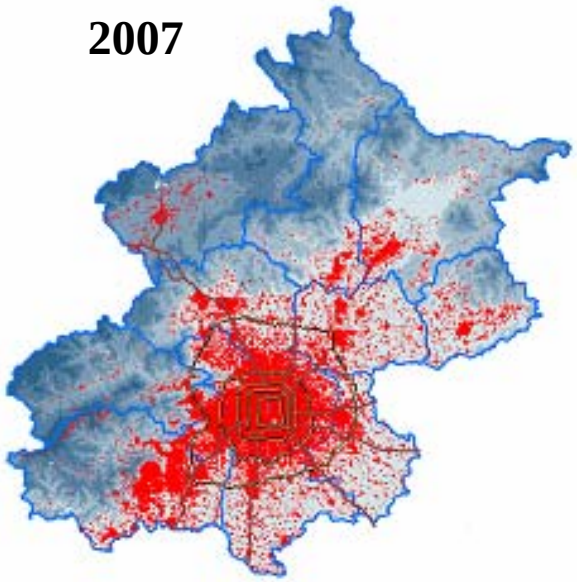


2020



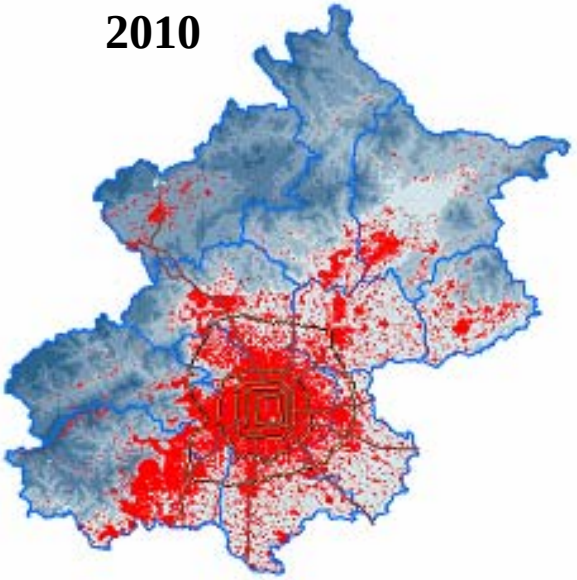
Urban expansion scenario in Beijing from 2007 to 2020 under the restriction of both the “green belt” and high-yield farmland protection area

2007

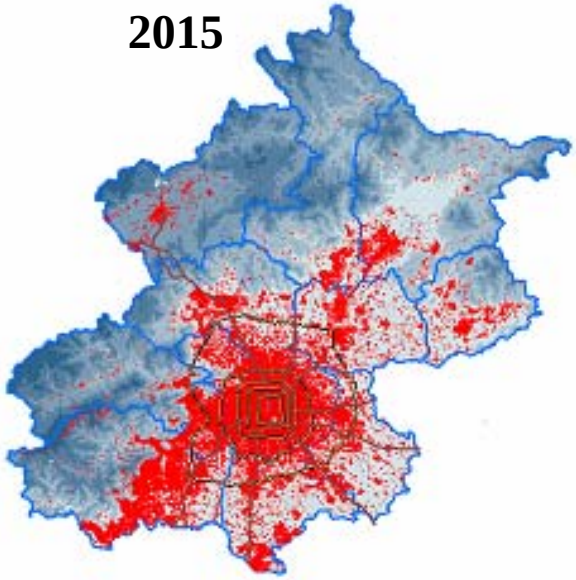


Expressway
Ringroad
Administrative boundary
0 - 184 m
184 – 441 m
441 - 717 m
717 - 1075 m
1075 - 2219 m
Urban area
0 40 Kilometers

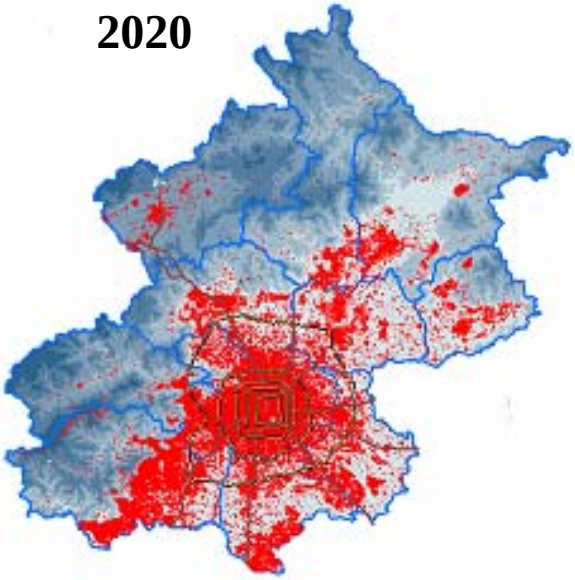
2010



2015



2020



该工作2006年9月发表在SSCI检索期刊“Applied Geography”上。

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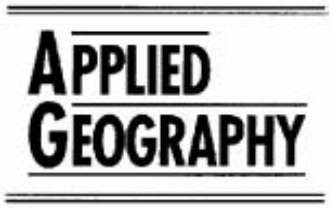

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Modeling urban expansion scenarios by coupling cellular automata model and system dynamic model in Beijing, China

Chunyang He[a,b,c,*], Norio Okada[c], Qiaofeng Zhang[d], Peijun Shi[a,b], Jingshui Zhang[a,b]

[a] *College of Resources Science & Technology, Beijing Normal University, Beijing, China*
[b] *Key Laboratory of Environmental Change and Natural Disaster, Ministry of Education of China, Beijing Normal University, Beijing 100875, China*
[c] *Research Center for Disaster Reduction Systems, Disaster Prevention Research Institute, Kyoto University, Gokasho, Uji, Kyoto 611-0011, Japan*
[d] *Department of Geosciences, Murray State University, Murray, KY 42071, USA*

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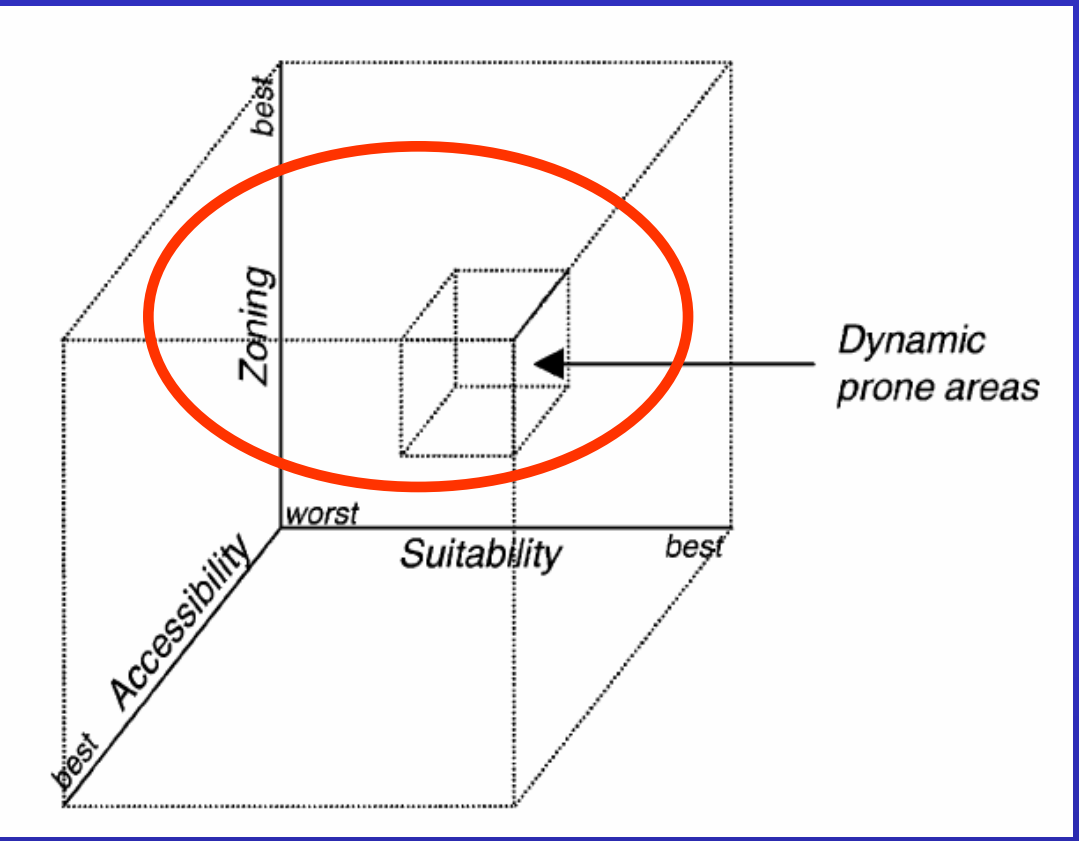
中国近十年地球科学领域发表论文总数超过两万篇(统计时段为2001年1月至2011年6月30日)

Rank	Country	Papers	Citations	Cites per paper
1	USA	88,546	1,247,282	14.09
2	ENGLAND	24,738	352,499	14.25
3	GERMANY	26,276	340,818	12.97
4	FRANCE	22,991	286,625	12.47
5	CANADA	18,669	205,351	11.00
6	PEOPLES R CHINA	26,662	186,998	7.01
7	AUSTRALIA	13,451	169,840	12.63
8	JAPAN	17,200	162,560	9.45
9	ITALY	14,051	137,707	9.80
10	SWITZERLAND	7,477	118,288	15.82
11	NETHERLANDS	6,854	93,298	13.61
12	RUSSIA	19,508	77,300	3.96
13	SPAIN	8,074	71,701	8.88
14	SWEDEN	5,102	64,383	12.62
15	NORWAY	5,310	61,263	11.54
16	DENMARK	3,422	49,101	14.35
17	SCOTLAND	3,957	45,975	11.62
18	INDIA	9,108	44,908	4.93
19	NEW ZEALAND	3,388	38,428	11.34
20	BELGIUM	3,201	38,051	11.89

中国的论文发表总数和论文总引用次数分别为**26,662** 和**186,998**，分列第**2**和第**6**，但平均每篇论文引用次数只有**7.01**，仅排在**20**国或地区中的第**18**位。

详情请见：http://sciencewatch.com/dr/cou/2011/11sepGEO/

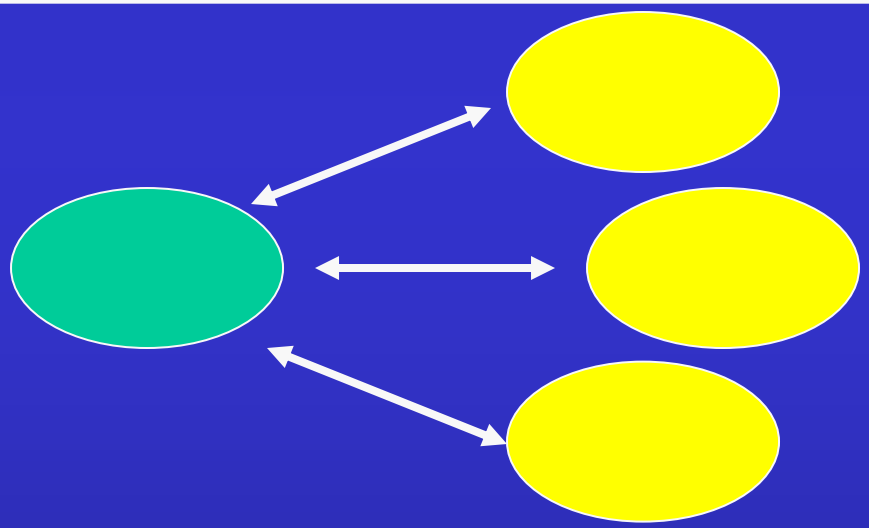
微观因素与宏观因素之间的”Gap”如何消除?



景观城市化过程是微观机理与宏观过程综合作用的结果吗?

Three-dimensional representation of the factors which actuate in urban land use dynamics in phase 1. (Barredo, et al., 2003)

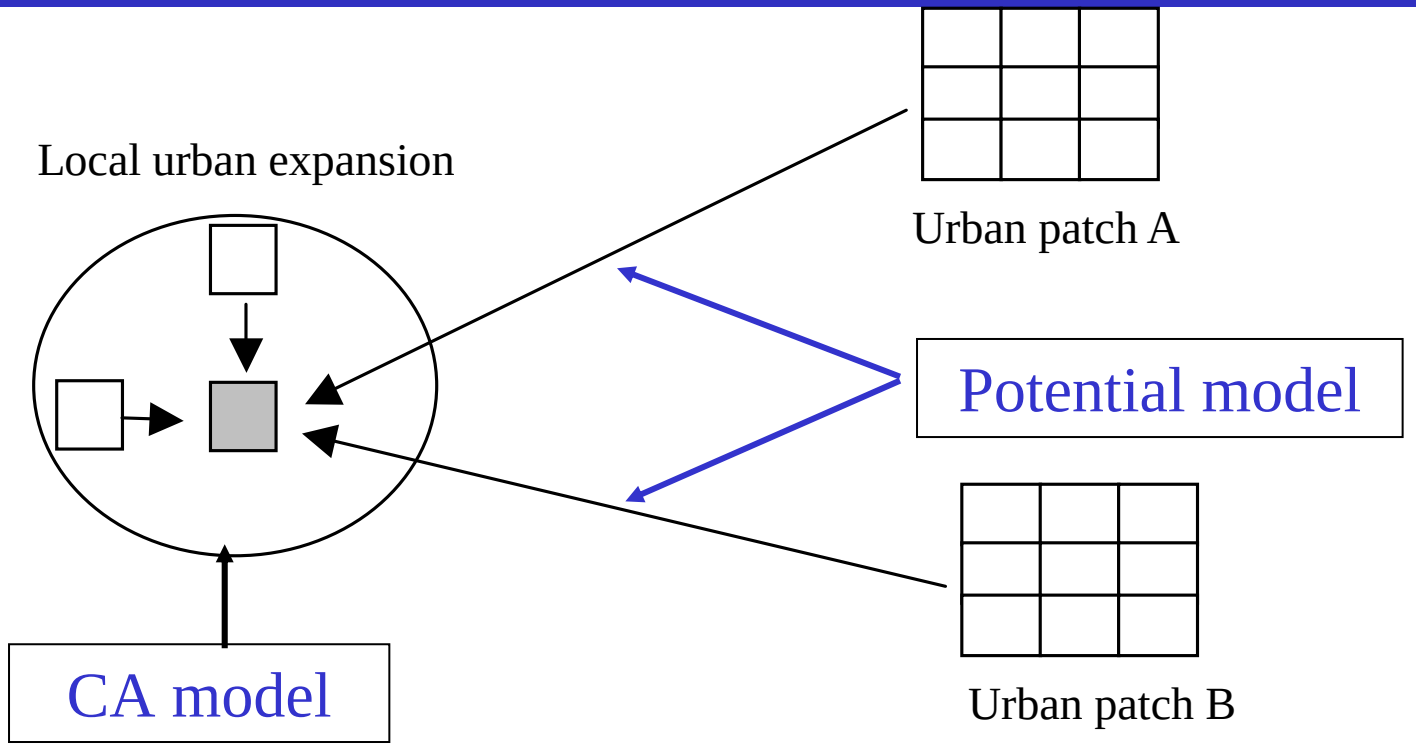
The potential models are derived from the classic gravity law used in Newtonian physic and spatial interactions (Berling-Wolff and Wu, 2004). They can specify the intensity of influence between two locations through interaction analogous to Newton's gravitational theories (Weber, 2003)



$$I_i = kM_i \frac{\sum_{i=1}^{n} M_j}{D_{ij}^b} \qquad (4)$$

The research will try to present a new **Urban Expansion Dynamic (UED) model** by incorporating a **potential model** with a **CA** model.

耦合潜力模型和CA模型，克服了微观机理和宏观过程之间相互联系的尺度障碍，发展了具有实际模拟能力的城市扩展动态模拟。

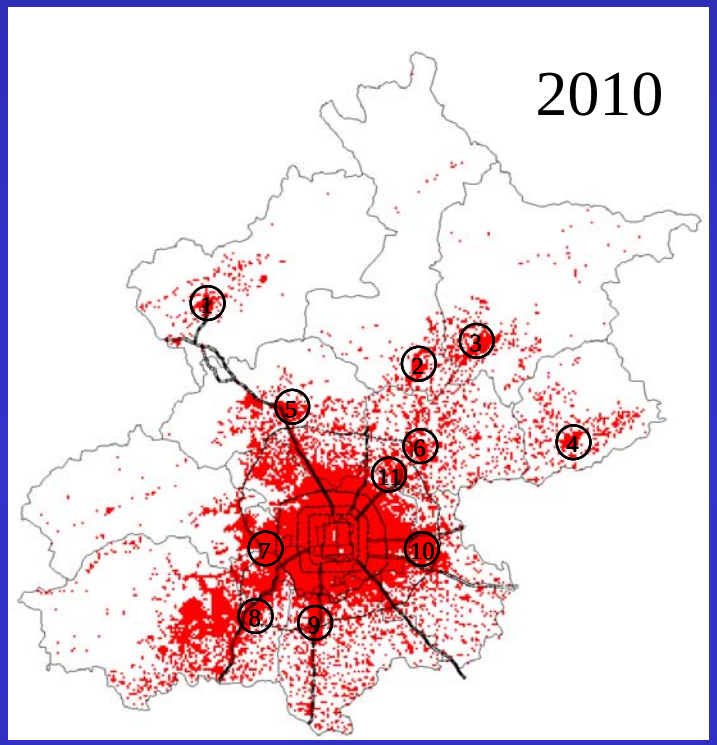


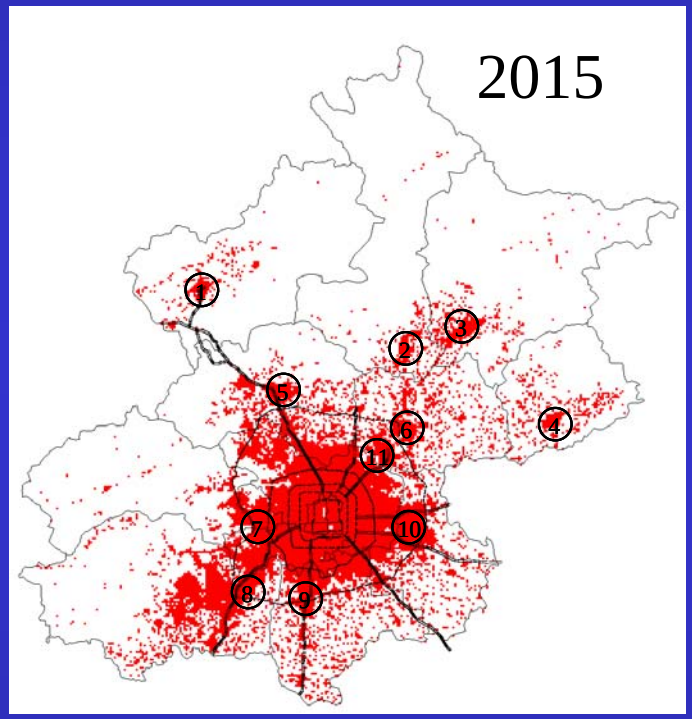
No-urban Land pixel to be occupied by urban expansion

Neighbourhood effect

Urbanization potential beyond neighbourhood

进一步提高了对城市扩展复杂过程的刻画和模拟能力。





Expressway Ringroad Administrative boundary Urban area

① Yanqing ② Huairou ③ Miyun ④ Pinggu ⑤ Changping

0 40 Kilometers

⑥ Shunyi ⑦ Mengtougouu ⑧ Fangshan ⑨ Daxing ⑩ Tongzhou ⑪ Capital airport

该工作2008年9月发表在SSCI/SCI检索期刊“Landscape urban planning”上。

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Landscape and Urban Planning 86 (2008) 79–91

LANDSCAPE AND URBAN PLANNING

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Modelling dynamic urban expansion processes incorporating a potential model with cellular automata

Chunyang He [a,b,c,*], Norio Okada [c], Qiaofeng Zhang [d], Peijun Shi [a,b], Jinggang Li [a,b]

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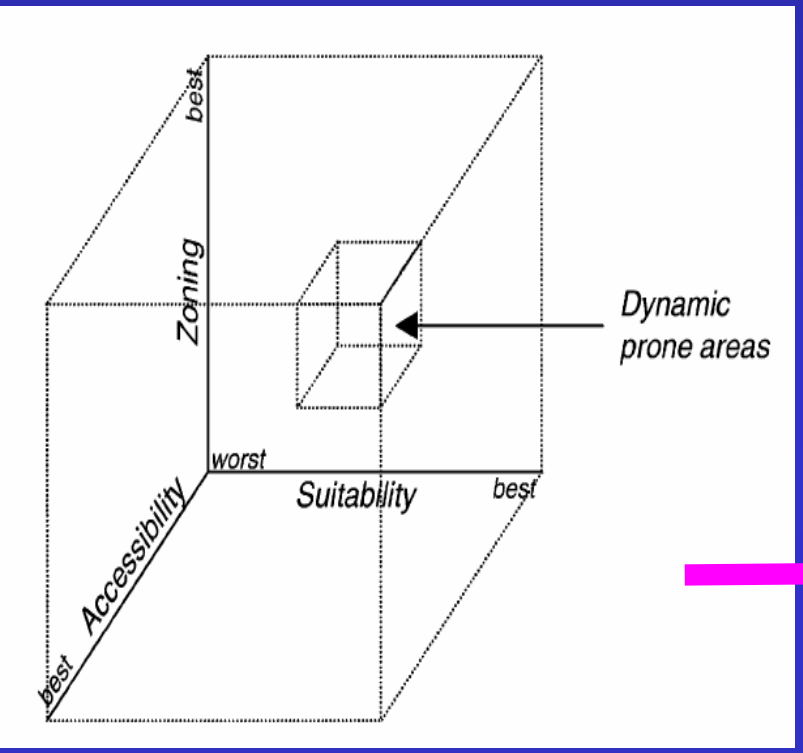
2010年4月，西班牙“University of Santiago de Compostela”的Inés Santé 教授在应邀发表在“Landscape and urban planning”上的综述论文 “Cellular automata models for the simulation of real-world urban processes: A review and analysis”中，把这两个模型选入自1998年最有影响的19个城市空间模型中，对他们进行了比较详细的分析和介绍。

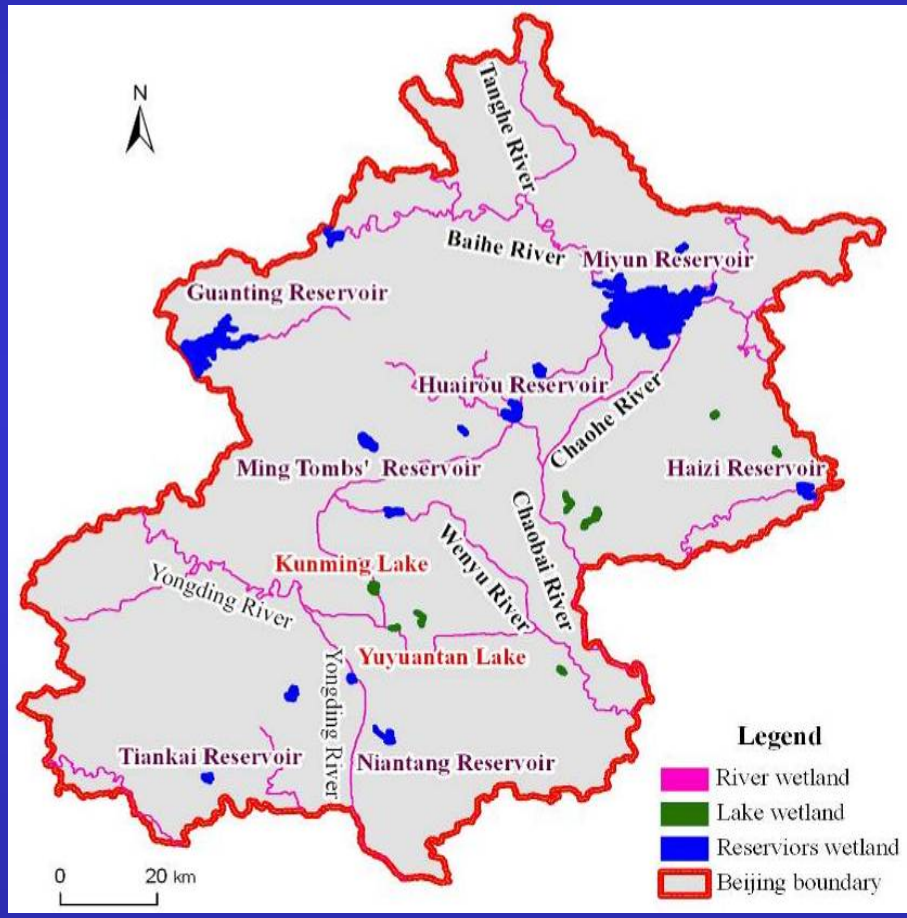
Table 2
Main characteristics of urban CA models with transition rules based on transition potential or probability.

Author	Objective[a]	Cell space	States	CA relaxations			Other methods	Calibration	Validation
				Neighborhood	Transition rule (calculation of the	Constraint[b]			
作者	目标	元胞大小	状态	元胞自动机			其他方法	校正	验证
				邻域	转换规则	限制性			
He et al. (2006)	描述性的，预测性的	180 m	城市，非城市	无明确说明	多因子加权求和，邻域影响和惯性常数。结果是依据环境和规划的限制乘以一个随机扰动项。	与“其他方法”中的模型相同	用于计算城市面积的系统动力学模型	Monte-Carlo方法	Kappa 系数
He et al. (2008	描述性的，预测性的	180 m	城市，非城市	以5个元胞为半径的圆	与He et al. (2006)中的模型相同，唯一不同的是惯性常数被城市扩展潜力所代替。	城镇用地的年增长率；人口增长	用于计算城市面积的线性回归模型。定义转换规则的潜力模型。识别因子和权重的多元统计工具。	Monte-Carlo方法	Kappa 系数
Chen and Masser (2004)	D, P	10 m cells	Urban, non-urban	Circular with a radius of 3–9 cells	Product of a stochastic disturbance term, the weighted sum of a set of factors, and a series of constraints	AGR	None	Empirical	distance Coincidence matrix. Consistency coefficients and Lee–Sallee index
Engelen et al. (1999)	D-M, P-M	100 m cells	14 land uses, 8 active uses	Circular with a radius of 8 cells	Product of a stochastic disturbance term, the suitability for the land use, the zoning for that use, and the effect of neighborhood	OTH	None	Sensitivity analysis	Kappa index
He et al. (2006)	D, P	180 m cells	Urban, non-urban	Not explicit	Weighted sum of a set of factors, the neighborhood effect, and an inertia constant. The result is multiplied by a stochastic disturbance term, and by	MOD	System dynamics-based model that calculates	Monte-Carlo approach	Kappa index

景观城市化过程模拟有什么作用？

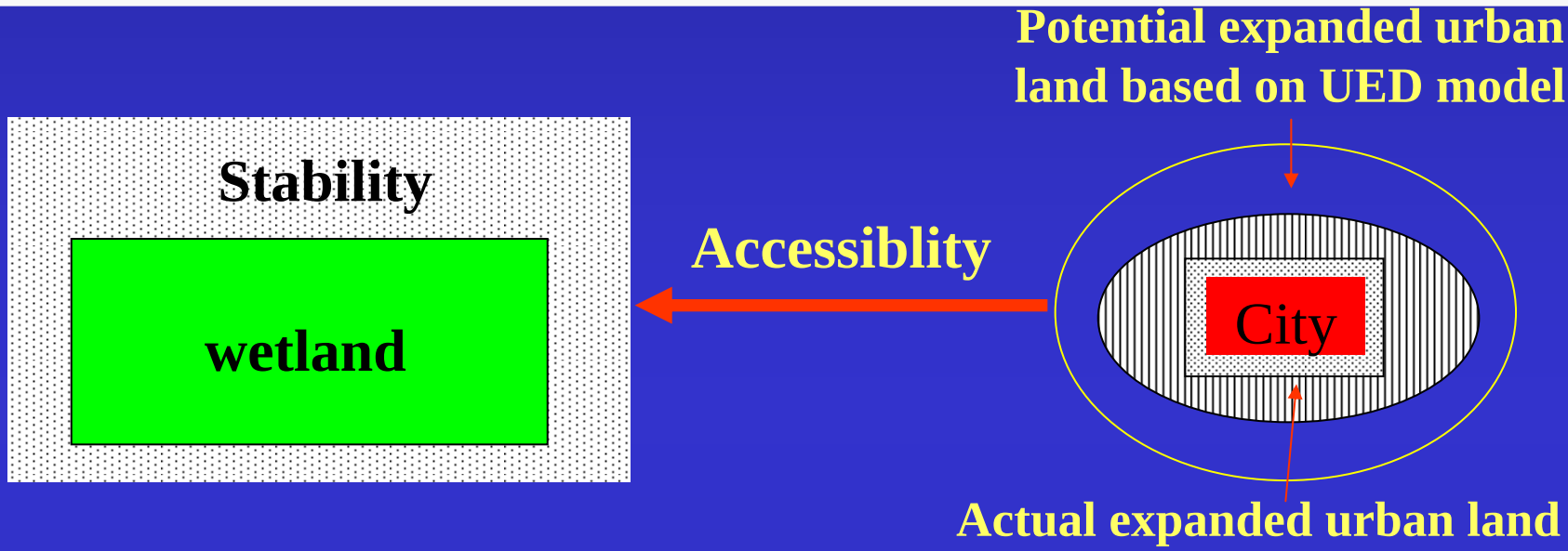


如何有效评估景观城市化过程对湿地生态系统的影响？



Reservoir , river and lake wetland in Beijing

Concept model of spatial stress to wetland

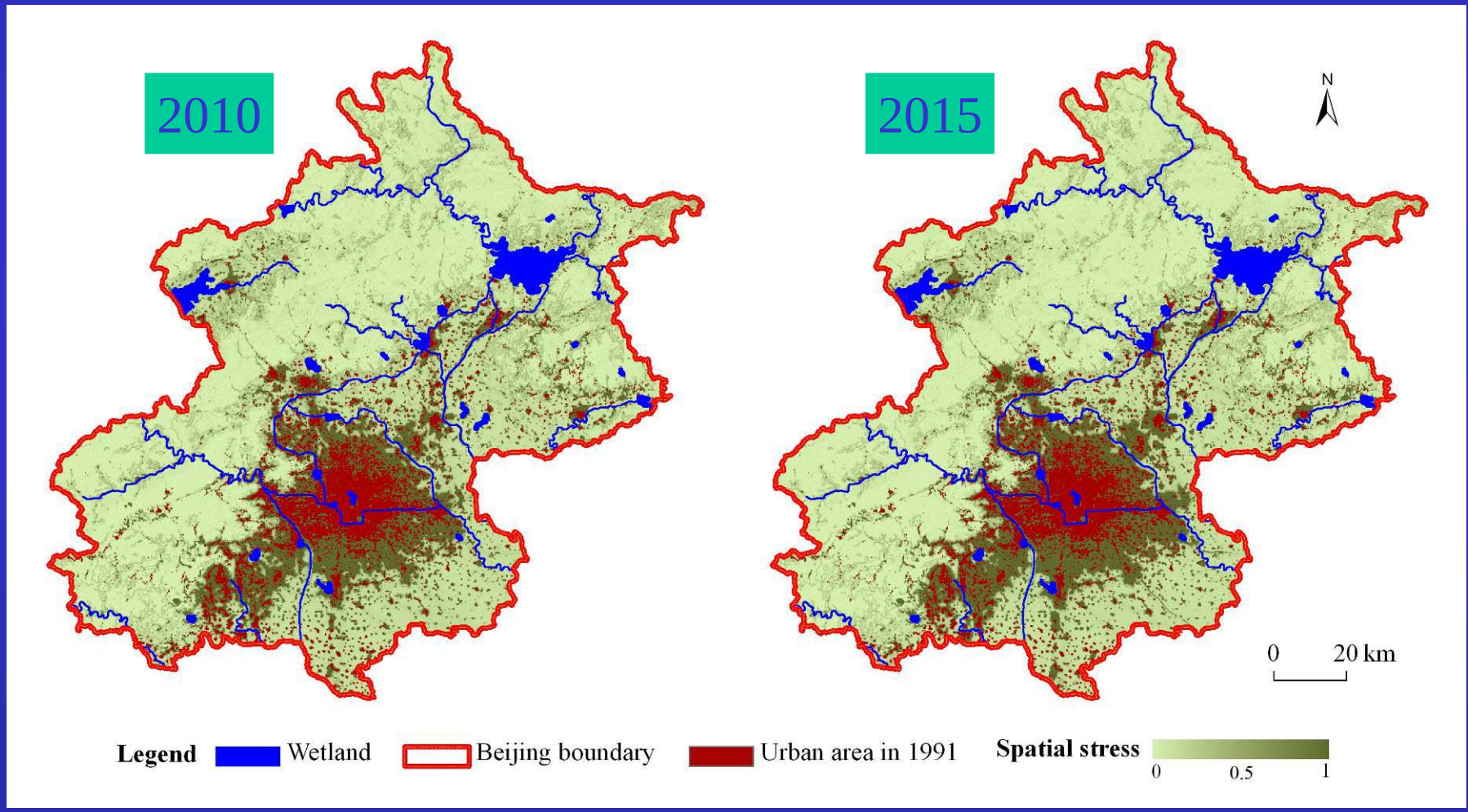


Actual and potential spatial stress due to urban expansion on wetlands

$$S^T = f(F, F^p A, N)$$

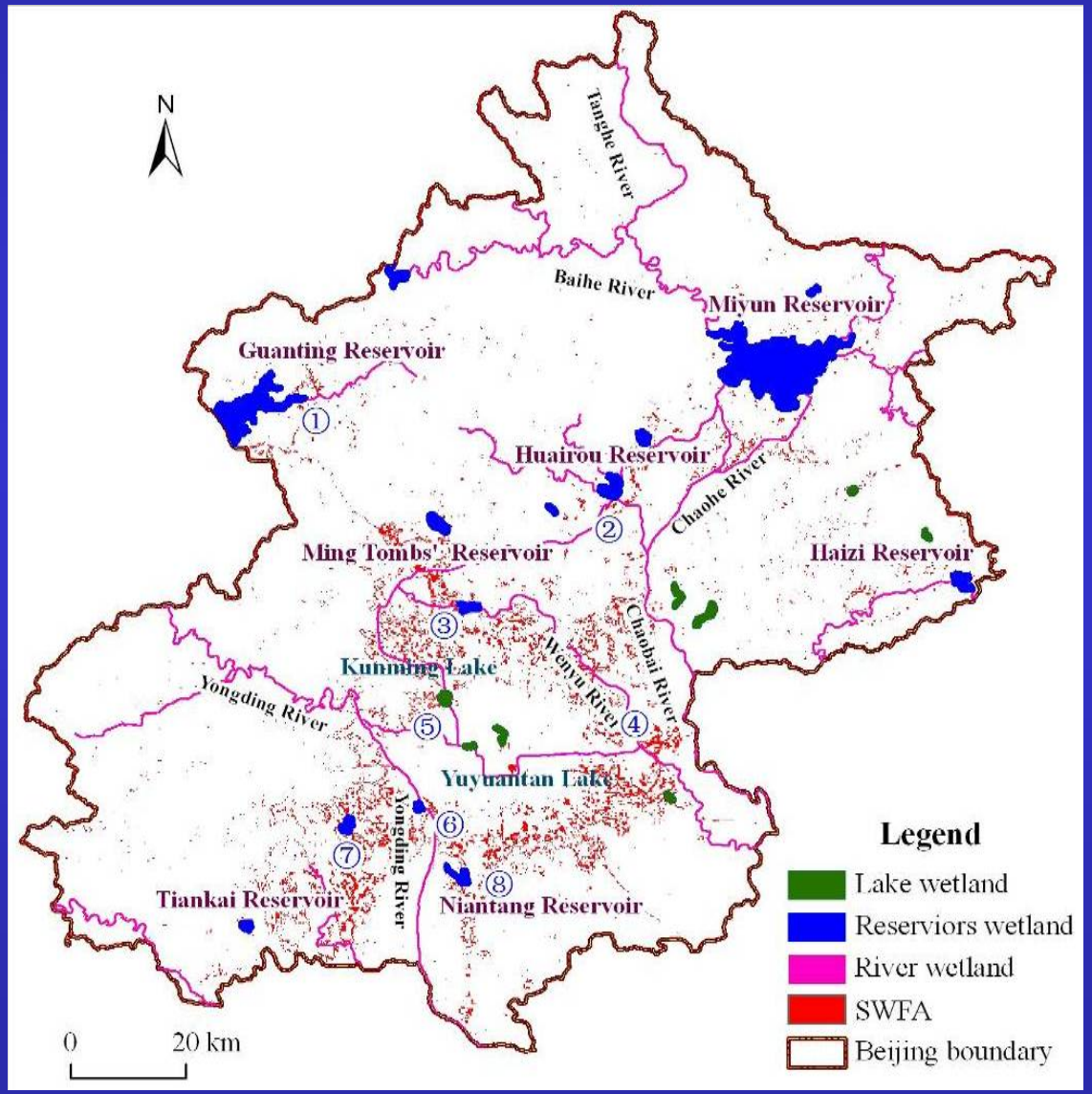
S^T is spatial stress，F、F^p、A、N represent the actual expanded urban land, potential expanded urban land, accessibility to the wetland and its neighborhood’s stability respectively.

Predicted spatial stress of urban lands on the major wetlands in Beijing by 2015



Distribution of the spatially highly stressed wetland fringe areas (SWFA) in Beijing

① The north of the Guanting reservoir
② The south of the Huairou reservoir
③ The South-west of the Shisanning reservoir
④ The area along with the Wenyu river in Tongzhou county
⑤ Kunming lake in summer palace
⑥ Dalin reservoir
⑦ Chongqing reservoir
⑧ Niantan reservoir



Landscape and Urban Planning 101 (2011) 269–277

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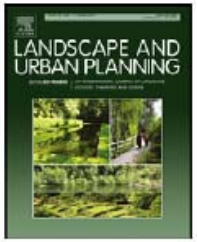

Simulation of the spatial stress due to urban expansion on the wetlands in Beijing, China using a GIS-based assessment model

Chunyang He[a,b,*], Jie Tian[c], Peijun Shi[a], Dan Hu[d]

[a] State Key Laboratory of Earth Surface Processes and Resource Ecology, Beijing Normal University, Beijing 100875, China
[b] College of Resources Science & Technology, Beijing Normal University, Beijing 100875, China
[c] Department of Geology and Geography, Georgia Southern University, Statesboro, GA 30460, USA
[d] State Key Lab of Urban & Regional Ecology, Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, Beijing 100085, China

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ABSTRACT

Based on the existing Urban Expansion Dynamic (UED) model, this paper develops a geographic information system (GIS)-based model that can be used to assess the current and potential spatial stress on a regional wetland ecosystem due to urban expansion. Synthetically utilizing the simulation capability of the UED model and the spatial analysis power of a GIS, this new model takes into account the present disturbance by ongoing urban expansion, the potential disturbance by future urban expansion, the acces-

Chunyang He, Jie Tian, Peijun Shi, Dan Hu, 2011, Simulation of the spatial stress due to urban expansion on the wetlands in Beijing, China using a GIS-based assessment model. *Landscap and Urban Planning*, 269-277。

专著和奖励

专著：何春阳，史培军. 2009，景观城市化与土地系统模拟，科学出版社。

获奖项目：土地利用/覆盖变化及其生态响应机制

获 奖 者：何春阳(第5完成人)

奖励等级：自然科学奖二等奖

奖励日期：2010年01月

证 书 号：2009-054

教育部

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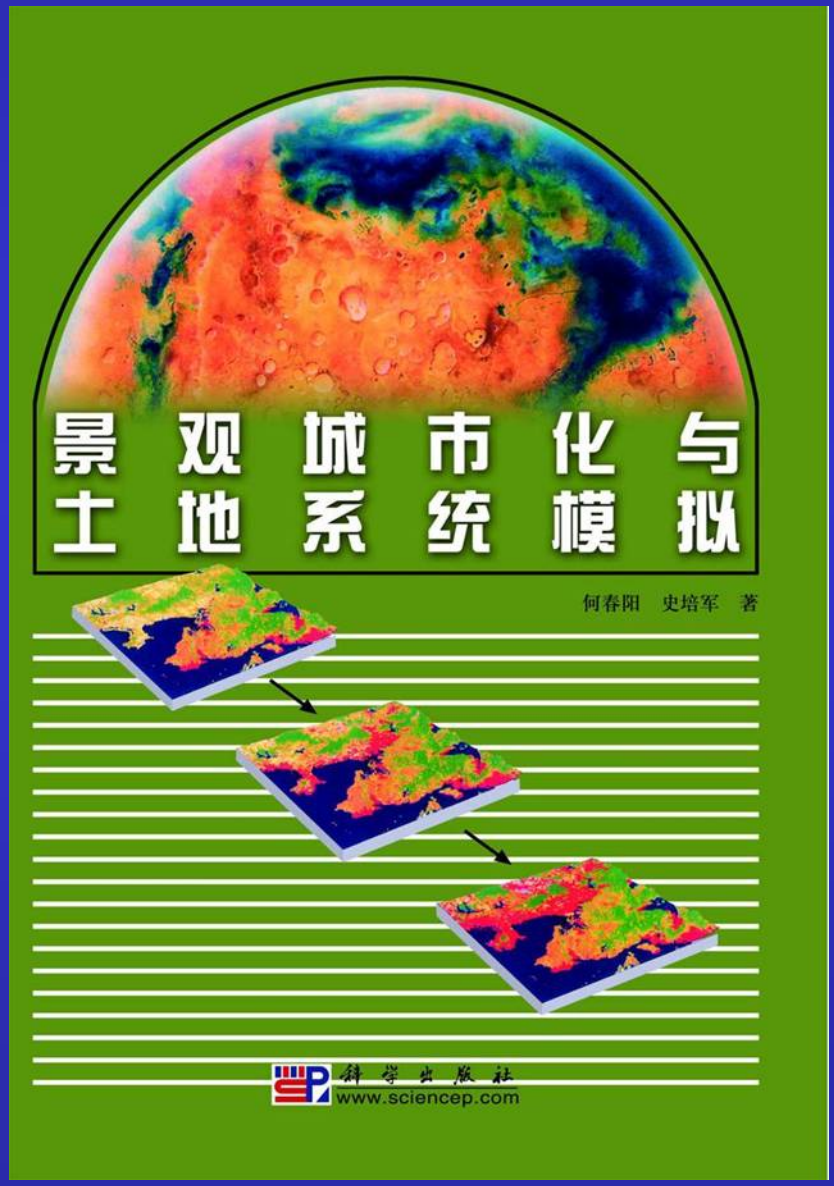


报告提纲

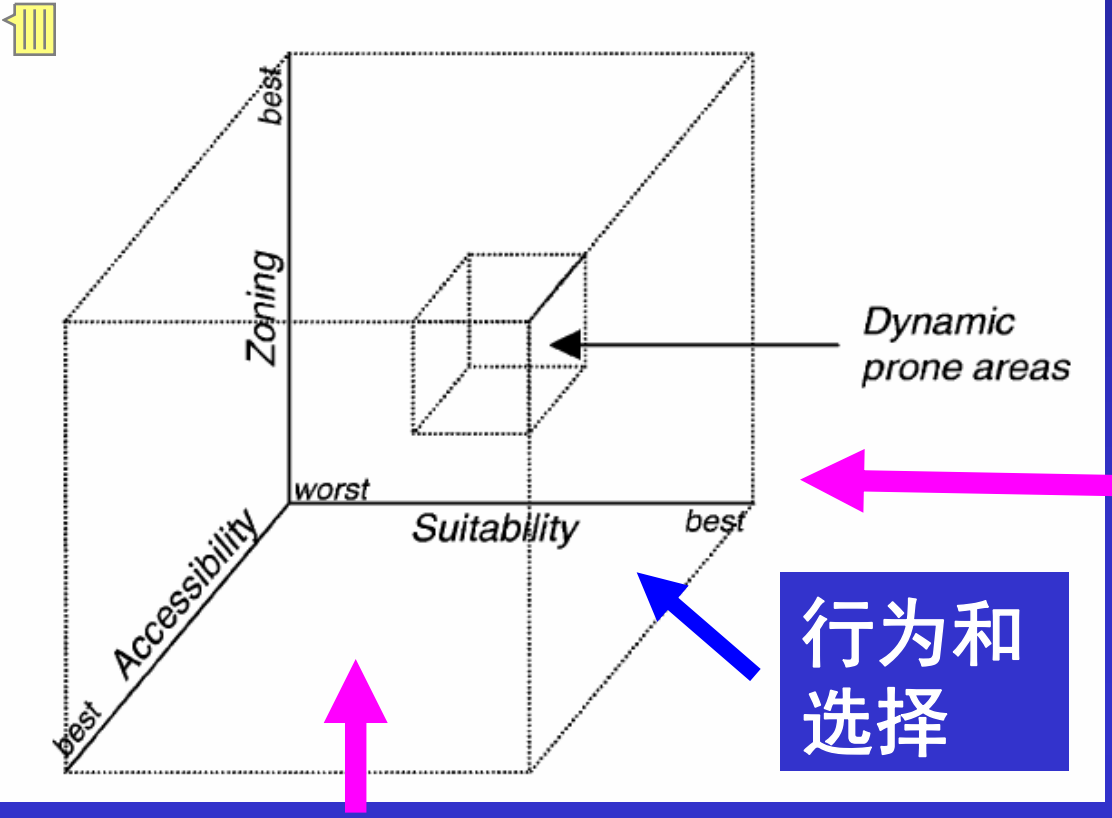
第一部分：景观城市化过程与影响

第二部分：景观城市化模拟的原理和方法

第三部分：景观城市化模拟的新思路与进展

第四部分：景观城市化模拟的趋势

趋势1：机理、过程与行为的统一



微观机理：微观的城市单元演化的基本规律（成本与收益）

* 聚集规律–规模效益–资本和产业

* 扩散规律–规模不经济的被动扩散；市场开拓下的主动扩散

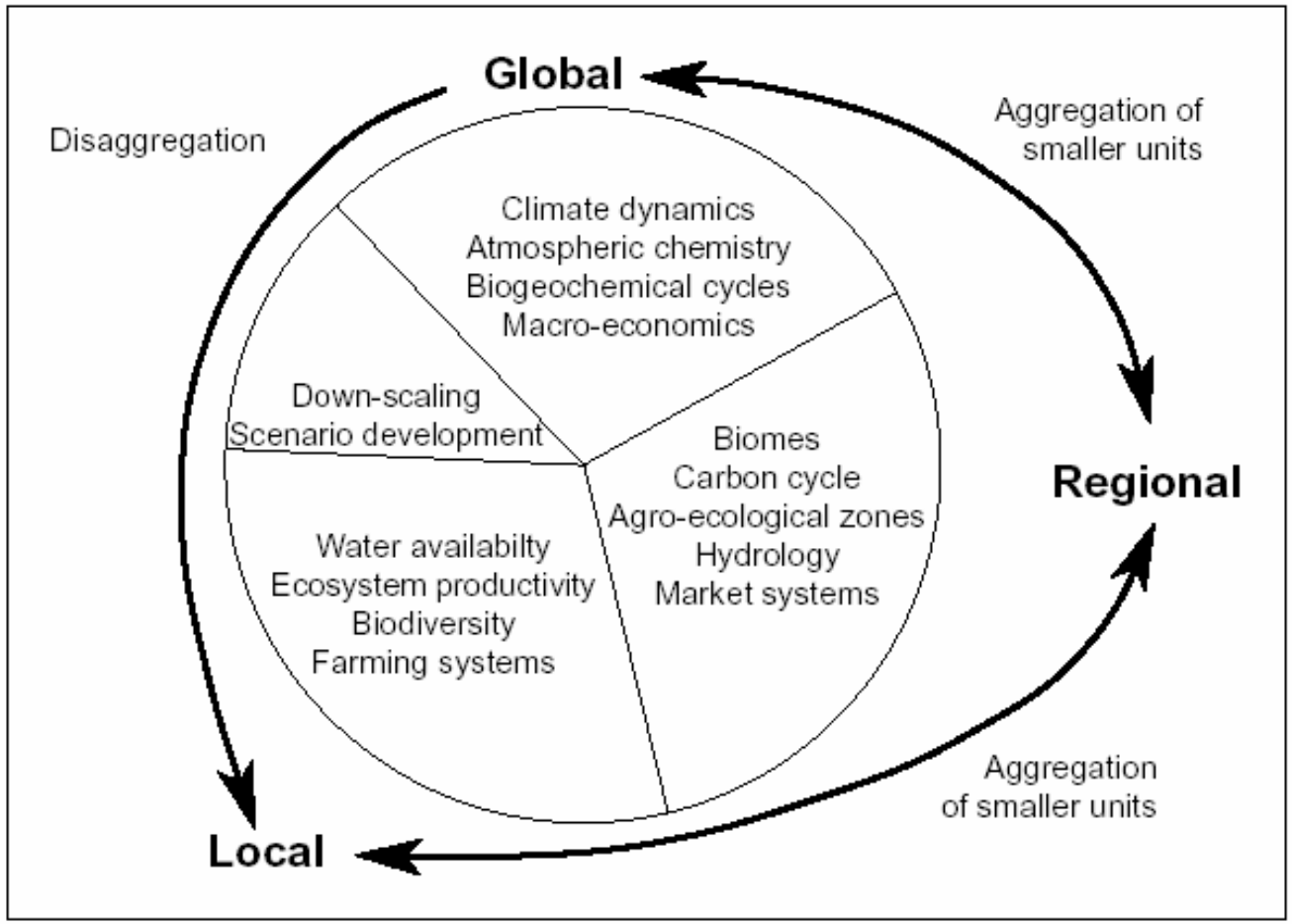
行为和选择

宏观过程：城市用地的总量需求变化过程。

- 国家战略与区域规划
- 人口与经济规模
- 资源环境承载能力

主体行为：政府、企业、个人、NGO.

趋势2：多尺度耦合模型



Integrated modelling framework. (R. Leemans)

景观城市化模型+物理效应模型（水，热，气）

景观城市化模型+生态效应模型（生物多样性，**NPP**）

景观城市化模型+化学效应模型（空气污染）

气候变化情景+景观城市化模型；灾害强度模型+景观城市化模型；资源环境承载力+景观城市化模型

北京师范大学资源学院教师主页——何春阳 - Windows Internet Explorer

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欢迎访问何春阳老师的个人主页！ 今天是2010年9月5日，星期日

何春阳 博士

阳研究小组动态

2010年研究小组工作重点 NEW

2010年7月5日，何春阳博士邀请美国伊利诺大学地理学系助理教授田杰博士做题为“遥感与地面监测的综合利用与环境质量预报”的学术报告。

详情请进>>

2010年7月3日，研究小组魏安妮同学顺利毕业，将赴德国斯图加

◆个人简介◆

出生年月： 1975年3月

籍　　贯： 四川射洪

学位职称： 博士、副教授

学　　历： 理学博士

政治面貌： 中共党员

专　　业： 自然地理学

研究方向： 城市化过程与风险；土地系统测量与模拟；土地利用规划环境影响评价

通讯地址： 北京市海淀区新街口外大街19号 北京师范大学资源学院 100875

邮　　箱： hcy@bnu.edu.cn

↑TOP

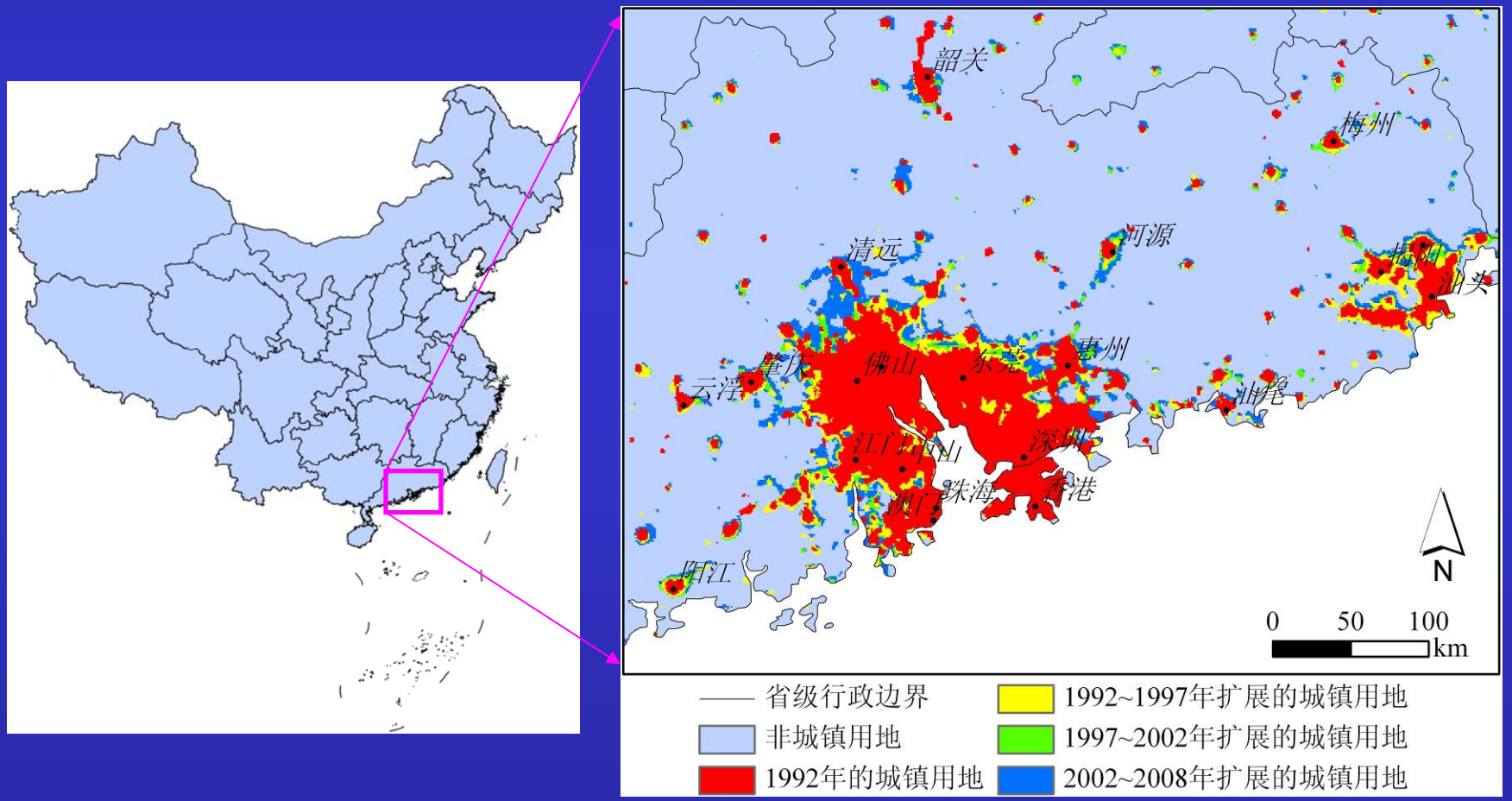
◆招生方向◆

谢谢大家！

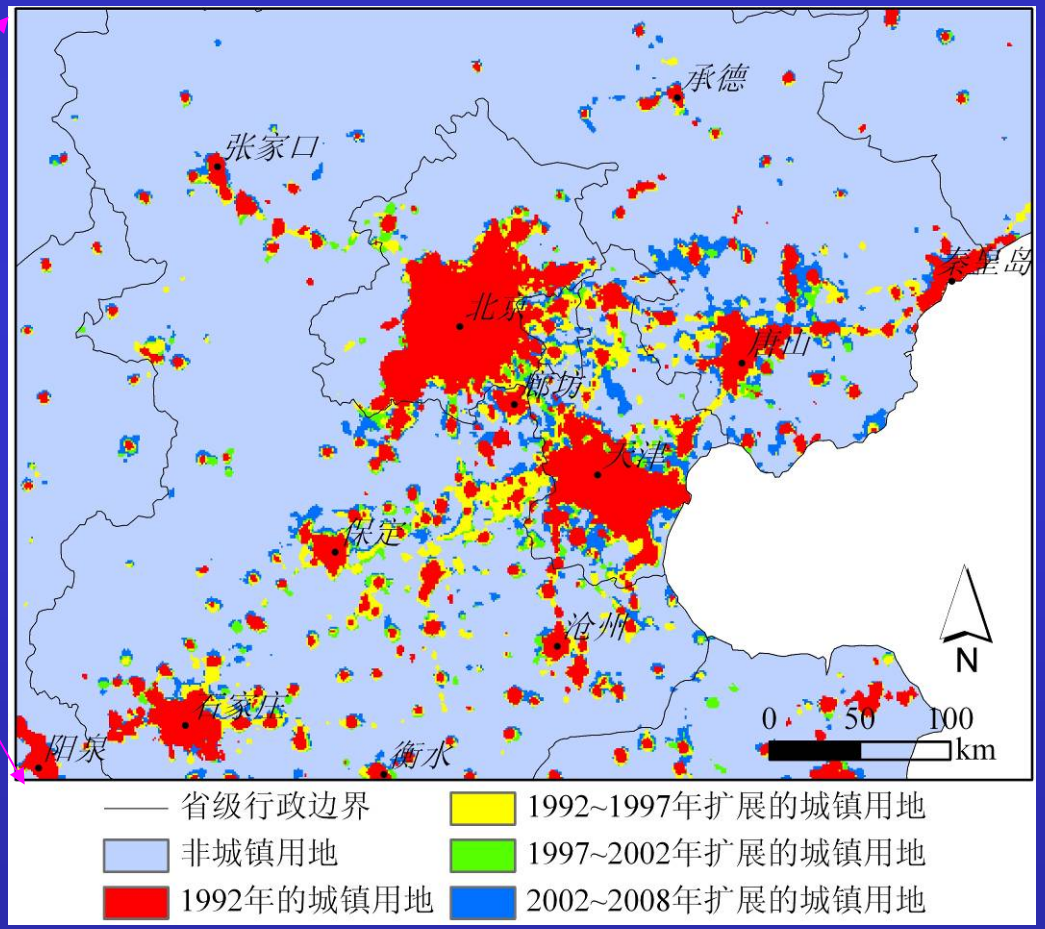
完成

Internet

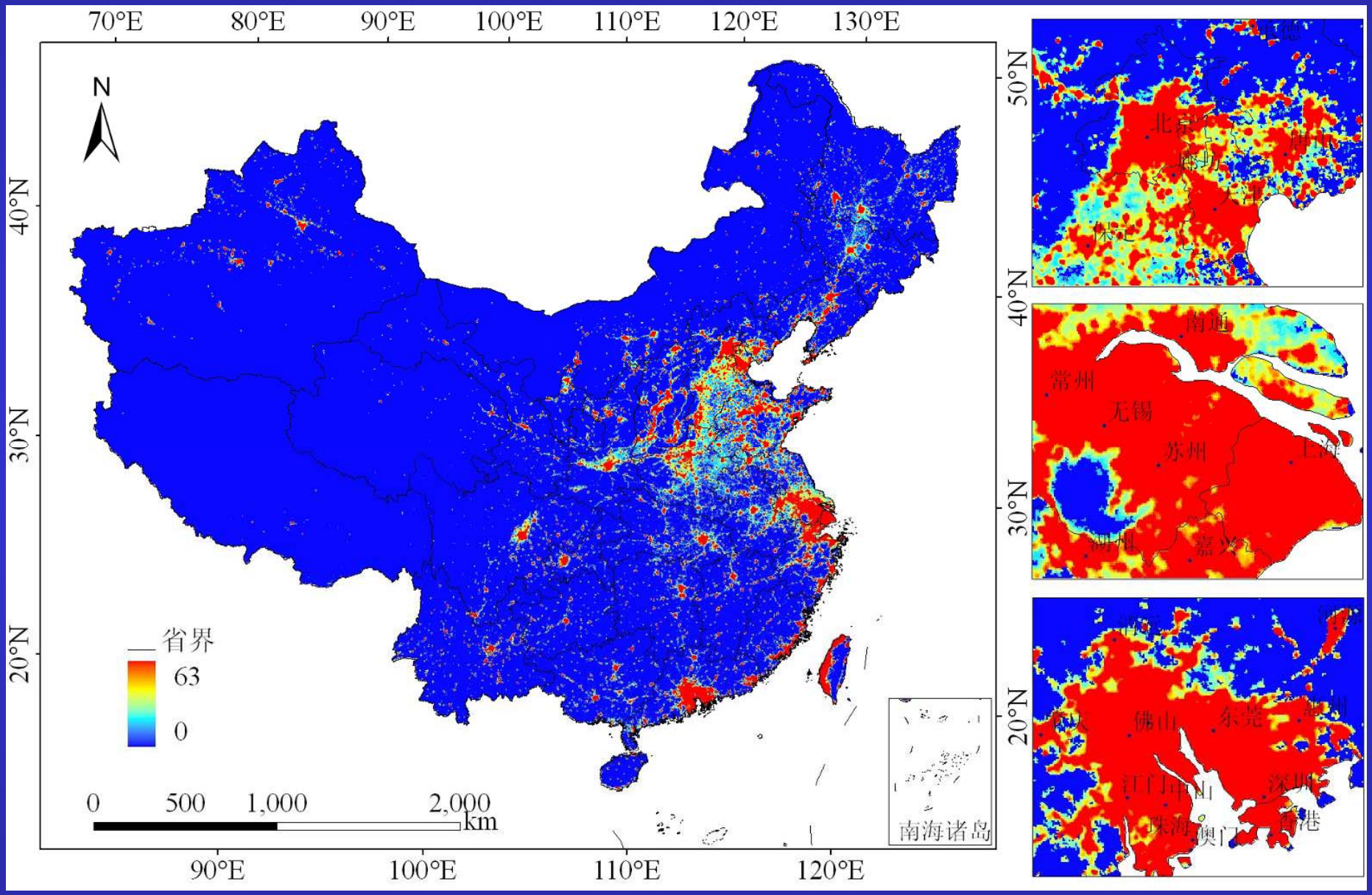
1992-2008年珠三角城市群城镇用地扩展过程



1992-2008年京津唐城市群城镇用地扩展过程



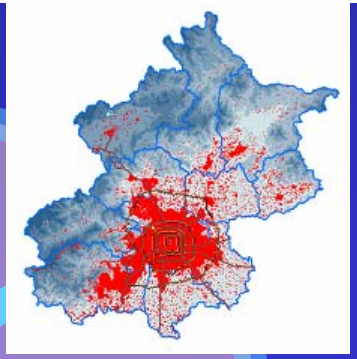
中国景观城市化特点3: 区域差异明显



中国地区2008年稳定夜间灯光指数

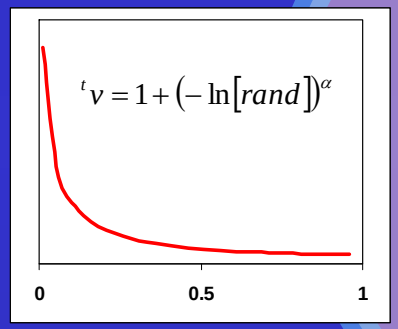
Urban land pattern allocation by CA model

Urban expansion at time T+1



Stochastic perturbation

&



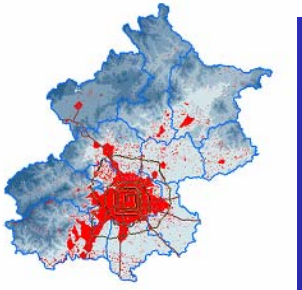
Allocation Rule

The cell with the highest possibility is selected as that would be occupied by urban expansion .

Probability

$$^{t}P_{K,x,y} = (\sum_{i=1}^{m-2} {}^{t}W_i \times {}^{t}S_{i,x,y} + W_{m-1} \times {}^{t}N_{x,y} - W_m \times {}^{t}I_{K,x,y}) \times \prod_{r=1} {}^{t}EC_{r,x,y} \times \prod_{l=1} {}^{t}PC_{l,x,y}$$

Urban exapnsion at time T



Suitability

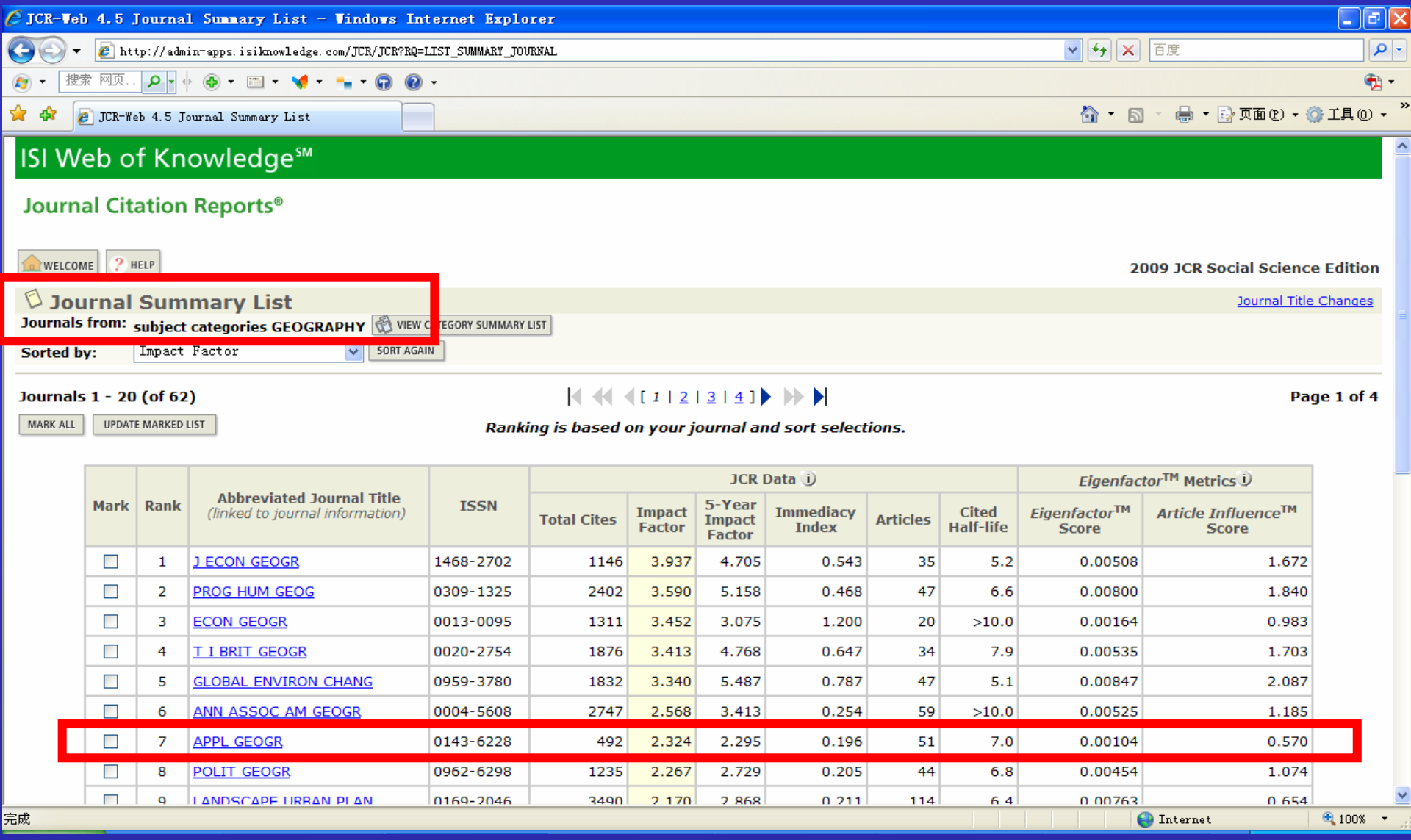
Neighborhood

Inherited attribute

Environmental constraints

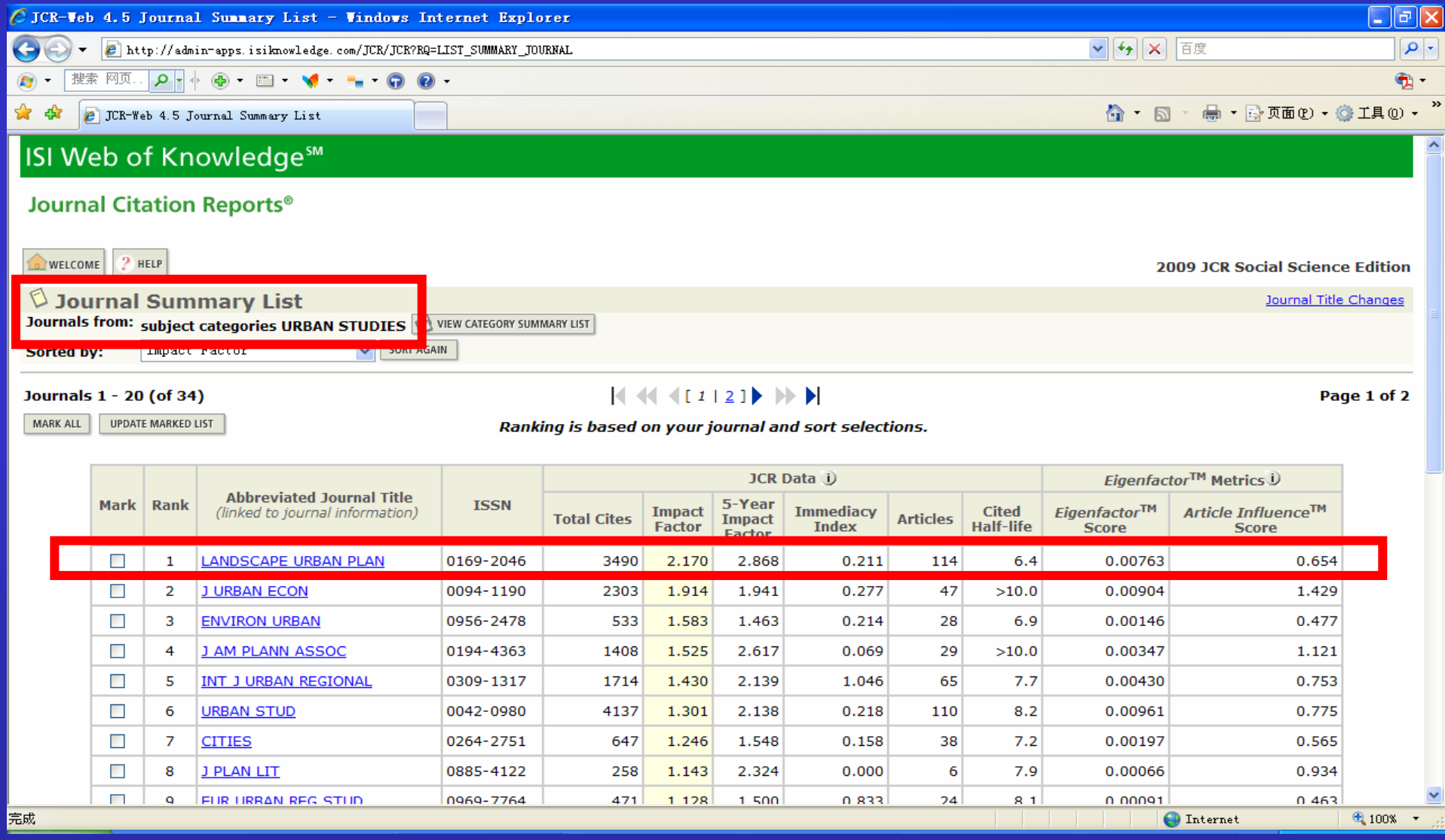
Land policy

据“Web of Science”数据库检索，该期刊2009年影响影子2.324，在62种“Geography”类SSCI检索期刊中，影响因子排名第七。



Mark	Rank	Abbreviated Journal Title (linked to journal information)	ISSN	JCR Data						Eigenfactor™ Metrics	
				Total Cites	Impact Factor	5-Year Impact Factor	Immediacy Index	Articles	Cited Half-life	Eigenfactor™ Score	Article Influence™ Score
☐	1	J ECON GEOGR	1468-2702	1146	3.937	4.705	0.543	35	5.2	0.00508	1.672
☐	2	PROG HUM GEOG	0309-1325	2402	3.590	5.158	0.468	47	6.6	0.00800	1.840
☐	3	ECON GEOGR	0013-0095	1311	3.452	3.075	1.200	20	>10.0	0.00164	0.983
☐	4	T I BRIT GEOGR	0020-2754	1876	3.413	4.768	0.647	34	7.9	0.00535	1.703
☐	5	GLOBAL ENVIRON CHANG	0959-3780	1832	3.340	5.487	0.787	47	5.1	0.00847	2.087
☐	6	ANN ASSOC AM GEOGR	0004-5608	2747	2.568	3.413	0.254	59	>10.0	0.00525	1.185
☐	7	APPL GEOGR	0143-6228	492	2.324	2.295	0.196	51	7.0	0.00104	0.570
☐	8	POLIT GEOGR	0962-6298	1235	2.267	2.729	0.205	44	6.8	0.00454	1.074
☐	9	LANDSCAPE URBAN PLAN	0169-2046	3490	2.170	2.868	0.211	114	6.4	0.00763	0.654

据“Web of Science”检索，该期刊2009年影响影子2.170，在34种“Urban studies”类的SSCI检索期刊中，影响因子排名第1。



JCR-Web 4.5 Journal Summary List - Windows Internet Explorer

http://admin-apps.isiknowledge.com/JCR/JCR?RQ=LIST_SUMMARY_JOURNAL

JCR-Web 4.5 Journal Summary List

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Journal Summary List

Journals from: subject categories URBAN STUDIES VIEW CATEGORY SUMMARY LIST

Journal Title Changes

Sorted by: Impact Factor SORT AGAIN

Journals 1 - 20 (of 34) [1 | 2] Page 1 of 2

MARK ALL UPDATE MARKED LIST

Ranking is based on your journal and sort selections.

Mark	Rank	Abbreviated Journal Title (linked to journal information)	ISSN	JCR Data						*Eigenfactor*™ Metrics	
				Total Cites	Impact Factor	5-Year Impact Factor	Immediacy Index	Articles	Cited Half-life	*Eigenfactor*™ Score	*Article Influence*™ Score
☐	1	LANDSCAPE URBAN PLAN	0169-2046	3490	2.170	2.868	0.211	114	6.4	0.00763	0.654
☐	2	J URBAN ECON	0094-1190	2303	1.914	1.941	0.277	47	>10.0	0.00904	1.429
☐	3	ENVIRON URBAN	0956-2478	533	1.583	1.463	0.214	28	6.9	0.00146	0.477
☐	4	J AM PLANN ASSOC	0194-4363	1408	1.525	2.617	0.069	29	>10.0	0.00347	1.121
☐	5	INT J URBAN REGIONAL	0309-1317	1714	1.430	2.139	1.046	65	7.7	0.00430	0.753
☐	6	URBAN STUD	0042-0980	4137	1.301	2.138	0.218	110	8.2	0.00961	0.775
☐	7	CITIES	0264-2751	647	1.246	1.548	0.158	38	7.2	0.00197	0.565
☐	8	J PLAN LIT	0885-4122	258	1.143	2.324	0.000	6	7.9	0.00066	0.934
☐	9	EUR URBAN REG STUD	0969-7764	471	1.128	1.500	0.833	24	8.1	0.00091	0.463

完成 Internet 100%