第1回
筑波大学トピック別GISセミナー

キックオフ講演会
於：総合研究棟A

筑波大学 GIS 研究教育コンソーシアム

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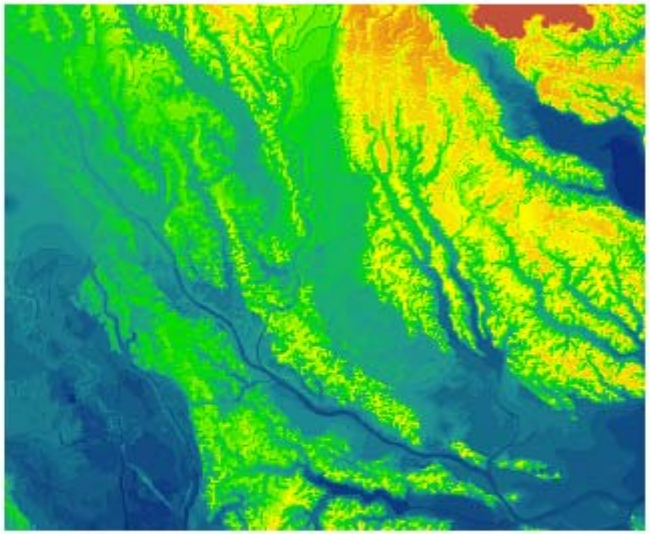

Welcome Message

近年，地理情報科学（GIScience）は，地理学，都市工学や地域計画学，情報学から生態学，資源管理，政策科学，考古学などを包含し，幅広い分野横断的な学問として急速に進化を遂げており，今後さらに地理情報科学の研究・教育を推進するためには，隣接諸分野が連携し研究者同士が相互に情報を交換・共有するとともに，広く社会に情報発信できる組織づくりが求められています．

このような背景のもと，筑波大学GIS研究教育コンソーシアムは，筑波大学に所属し学際的な科学としての地理情報科学に関する研究教育に携わっている教職員を対象に，研究者間の交流，情報交換と共有の場の提供，地理情報科学に関する研究教育の推進，情報発信等を目的として設立されました．

--- お知らせ ---

・2008年08月28日　第1回筑波大学トピック別GISセミナー（2008年10月6日）開催のご案内．

・2008年07月01日　筑波大学GIS研究教育コンソーシアム　ホームページを開設いたしました．

筑波大学
University of Tsukuba

010904

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- 研究概要
- メンバー
- 研究会
- 研究成果
- ArcGIS操作方法
- Geography Network
- 資格認定
- リンク
- メンバー専用

【以下は学内専用】

ArcGIS Download

筑波大学
Geography Network

地理情報科学の教授法の確立 -大学でいかに効果的にGISを教えるか-

●本研究は文部省科学研究費により(研究代表者:生命環境科学研究科・教授　村山祐司)，地理データを系統的に構築，管理，分析，伝達する汎用的な方法を探究する学際的な科学としての地理情報科学(GIScience)を対象に大学におけるその効果的な教授法を確立することを目的としています．

●その一環として学内において任意の端末室や教室，研究室でGISソフトを利用できる環境を整備するためArcGISのサイトライセンスを導入し，ダウンロードサービスを行っています．

●また，地理的範囲やメタデータ項目など種々の検索条件で必要な地理データサービスを効率的に見つけることができる，地理情報ポータルサイトとして，筑波大学Geography Networkを運用しています．

■新着情報 -What's new?-

・2008.7.1 **【筑波大学GIS研究教育コンソーシアム】**が設立されました． コンソーシアムのページへ

・2008.4.9 ArcGISサイトライセンスおよびGeography Network導入の意義と課題
ー筑波大学を事例にー，人文地理学研究 32，1-16 【研究成果】のページへ

・2008.4.7 **【資格認定(GIS学術士・専門学術士)のページ】**を追加しました

・2008.2.26 ■■サイトライセンス利用状況等をまとめました■■ (HTML) (PDF)

・2008.2.18 2007年度全体報告会資料をアップしました

・2008.01.31 【ArcGIS9.2 Service Pack 4】リリース，およびMicrosoft Windows Vistaへの対応について

サービスパック等のダウンロードについては「ArcGIS Download」ページにて
ログインIDおよびパスワードをご確認の上，ESRIサポートページへ

・2007.9.6 【ArcGIS9.2 Service Pack 3】がリリースされました

・2007.6.5 最新版のArcGIS 9.2をご利用頂けます(学内専用)

ArcGIS 9.2 ダウンロードサービス開始

ダウンロードおよびインストール方法は，ArcGIS 9.2インストールガイド(PDF)をご参照下さい

・2007.5.30 ArcGISキャンパスライセンスのポスターを作製しました(PDF)

GIS研究の最新動向

村山　祐司
（筑波大学大学院）
2008年10月6日

地理空間情報の可視化と流通

- 印刷革命（15世紀中葉）

  紙地図を印刷し，配布
- 情報革命（20世紀末）

  デジタル地図を瞬時に不特定多数に配信
- GIS革命（今日）

  Web上でデジタル地図を分析・加工，そして伝達

プレゼンテーションの構成

1) 地理情報科学の台頭と深化
2) 地理情報科学をめぐる最近の動き
3) 考え方，方法論の転換
4) 日本におけるGIS研究の問題点と課題
5) これからのGIS研究

GISのあゆみ

- 1950年代
  - 軍事目的
- 1960年代
  - 地図作成
- 1970年代
  - 施設管理
- 1980年代
  - 行政業務
- 1990年代
  - ビジネス
- 2000年代
  - 生活支援

技術の開発

ツールとして発展

ツールから学問へ

地理情報科学の誕生

1) 地理情報科学とは

- 空間データを系統的に取得，管理，分析，総合，伝達する汎用的方法とそれを諸学問へ応用する方法を探求する学術的分野

（出典：CSIS)

地理情報科学の推進には

- 地理学，情報科学，地図学，認知科学，社会工学をはじめ隣接諸科学が英知を結集し，連携を密にすることが不可欠

  → 欧米では，分野横断的連携を強化し多様な人材をリクルートし配置

  たとえば，

  可視化を探求する芸術系の専門家

  セキュリティや特許を担当する法律家

  ビジネス起業家の育成を支援する経営学者

学術雑誌の誌名変更と創刊

誌名変更

The American Cartographer → Cartography and Geographical Information Science (1990)

International Journal of Geographical Information Systems → International Journal of Geographical Information Science (1997)

Mapping Sciences & Remote Sensing → GIScience & Remote Sensing (2004)

創刊

Journal of Geographical Systems (1994)

Transactions in GIS (1996)

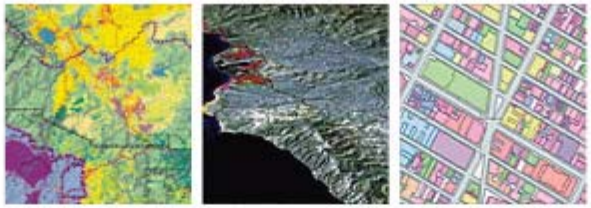
GeoInformatica (1997)

Geographical and Environmental Modelling (1997)

2) 地理情報科学をめぐる最近の動き

- 学科間連携，センターの創設
- 大学間連合
- コアカリキュラム
- 資格制度
- 産官学連携
- 国際会議

Center for Geographic Analysis
Harvard University



The Institute for Quantitative Social Science
at Harvard University

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Center for Geographic Analysis

The Center for Geographic Analysis at Harvard University was founded in 2006 as a technology platform in the Institute for Quantitative Social Science, building on the foundation already created by the Harvard Geospatial Library and the Harvard Map Collection. The Center has permanent professional staff who can guide and support research projects, administer Harvard-wide GIS infrastructure and collect and disseminate spatial datasets.

Newsletter: September, 2008 --> Subscribe me
Address: 1737 Cambridge St., K319 - K321, Cambridge, MA 02138
Email: contact[at]help.cga.harvard.edu

What's Happening Now

Seminars by Dr. David J. Maguire, Director and Chief Scientist of ESRI

Date: Friday, September 26th

- 12:00–1:30 PM @ SEAS, Pierce Hall, Room 100F
  Title: "Current and Future Trends in Modeling Geographic Systems"
- 4:00-6:00 PM @ 1737 Cambridge St., CGIS Knafel, Room 354
  Title: "Current and Future Trends in GIS"

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University Consortium for Geographic Information Science

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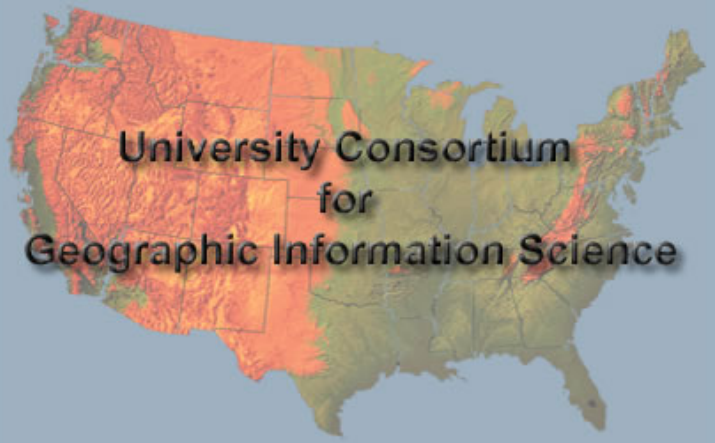

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Call for Papers: IEEE International Workshop on Spatial and Spatiotemporal Data Mining (SSTDM-08)
Deadline: 8/1/2008 Pisa, Italy
This is a call for papers for SSTDM-08 workshop to be held in conjunction with the IEEE International Conference on Data Mining, Pisa, Italy, December 15-19, 2008...more information

Call for Papers: GEOWS 2009, The International Conference on Advanced Geographic Information Systems & Web Services
Deadline: 9/1/2008 Cancun, Mexico
Please consider to contribute to and/or forward to the appropriate groups the opportunity to submit and publish original scientific results for the International Conference on Advanced Geographic Inf...more information

Call for Papers: Special issue of Computers, Environment and Urban Systems

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June 22-23, 2009
UCGIS Summer Assembly

UCGIS 2008 Awards

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Dr. Mike Worboys

Education Award

Dr. Michael Phoenix

Geographic Information Science & Technology Body of Knowledge

Edited by David DiBiase, Michael DeMers, Ann Johnson, Karen Kemp, Ann Taylor Luck, Brandon Plewe, and Elizabeth Wentz

UNIVERSITY CONSORTIUM FOR GEOGRAPHIC INFORMATION SCIENCE

Analytical Methods

AM1 Academic and analytical origins
1-1 Academic foundations
1-2 Analytical approaches

AM2 Query operations and query languages
2-1 Set theory
2-2 Structured Query Language (SQL) and attribute queries
2-3 Spatial queries

AM3 Geometric measures
3-1 Distances and lengths
3-2 Direction
3-3 Shape
3-4 Area
3-5 Proximity and distance decay
3-6 Adjacency and connectivity

AM4 Basic analytical operations
4-1 Buffers
4-2 Overlay
4-3 Neighborhoods
4-4 Map algebra

AM5 Basic analytical methods
5-1 Point pattern analysis
5-2 Kernels and density estimation
5-3 Spatial cluster analysis
5-4 Spatial interaction
5-5 Analyzing multidimensional attributes
5-6 Cartographic modeling
5-7 Multi-criteria evaluation
5-8 Spatial process models

AM6 Analysis of surfaces
6-1 Calculating surface derivatives
6-2 Interpolation of surfaces
6-3 Surface features
6-4 Intervisibility
6-5 Friction surfaces

AM7 Spatial statistics
7-1 Graphical methods
7-2 Stochastic processes
7-3 The spatial weights matrix
7-4 Global measures of spatial association
7-5 Local measures of spatial association
7-6 Outliers
7-7 Bayesian methods

AM8 Geostatistics
8-1 Spatial sampling for statistical analysis
8-2 Principles of semi-variogram construction
8-3 Semi-variogram modeling
8-4 Principles of kriging
8-5 Kriging variants

AM9 Spatial regression and econometrics
9-1 Principles of spatial econometrics
9-2 Spatial autoregressive models
9-3 Spatial filtering
9-4 Spatial expansion and Geographically Weighted Regression (GWR)

AM10 Data Mining
10-1 Problems of large spatial databases
10-2 Data mining approaches
10-3 Knowledge discovery
10-4 Pattern recognition and matching

AM11 Network analysis
11-1 Networks defined
11-2 Graph theoretic (descriptive) measures
11-3 Least-cost (shortest) path
11-4 Flow modeling
11-5 The Classic Transportation Problem
11-6 Other classic network problems
11-7 Accessibility Modeling

AM12 Optimization and location-allocation modeling
12-1 Operations research modeling and location modeling principles
12-2 Linear programming
12-3 Integer programming
12-4 Location-allocation modeling and

Conceptual Foundations

CF1 Philosophical foundations
1-1 Metaphysics and ontology
1-2 Epistemology
1-3 Philosophical perspectives

CF2 Cognitive and social foundations
2-1 Perception and cognition of geographic phenomena
2-2 From concepts to data
2-3 Geography as a foundation for GIS
2-4 Place and landscape
2-5 Common-sense geographies
2-6 Cultural influences
2-7 Political influences

CF3 Domains of geographic information
3-1 Space
3-2 Time
3-3 Relationships between space and time
3-4 Properties

CF4 Elements of geographic information
4-1 Discrete entities
4-2 Events and processes
4-3 Fields in space and time
4-4 Integrated models

CF5 Relationships
5-1 Categories
5-2 Mereology: structural relationships
5-3 Genealogical relationships: lineage, inheritance
5-4 Topological relationships
5-5 Metrical relationships: distance and direction
5-6 Spatial distribution
5-7 Region
5-8 Spatial integration

CF6 Imperfections in geographic information
6-1 Vagueness
6-2 Mathematical models of vagueness: Fuzzy sets and rough sets
6-3 Error-based uncertainty
6-4 Mathematical models of uncertainty: Probability and statistics

Cartography and Visualization

CV1 History and trends
1-1 History of cartography
1-2 Technological transformations

CV2 Data considerations
2-1 Source materials for mapping
2-2 Data abstraction: classification, selection, and generalization
2-3 Projections as a map design issue

CV3 Principles of map design
3-1 Map design fundamentals
3-2 Basic concepts of symbolization
3-3 Color for cartography and visualization
3-4 Typography for cartography and visualization

CV4 Graphic representation techniques
4-1 Basic thematic mapping methods
4-2 Multivariate displays
4-3 Dynamic and interactive displays
4-4 Representing terrain
4-5 Web mapping and visualizations
4-6 Virtual and immersive environments
4-7 Spatialization
4-8 Visualization of temporal geographic data
4-9 Visualization of uncertainty

CV5 Map production
5-1 Computational issues
5-2 Map production
5-3 Map reproduction

CV6 Map use and evaluation
6-1 The power of maps
6-2 Map reading
6-3 Map interpretation
6-4 Map analysis
6-5 Evaluation and testing
6-6 Impact of uncertainty

Design Aspects

DA1 The scope of GIS&T system design
1-1 Using models to represent information and processes
1-2 Components of models: data, structures, procedures
1-3 The scope of GIS&T applications
1-4 The scope of GIS&T design
1-5 The process of GIS&T design

DA2 Project definition
2-1 Problem definition
2-2 Planning for design
2-3 Application/user assessment
2-4 Requirements analysis
2-5 Social, political, and cultural issues

DA3 Resource planning
3-1 Feasibility analysis
3-2 Software systems
3-3 Data costs
3-4 Labor and management
3-5 Capital: facilities and equipment
3-6 Funding

DA4 Database design
4-1 Modeling tools
4-2 Conceptual model
4-3 Logical models
4-4 Physical models

DA5 Analysis design
5-1 Recognizing analytical components
5-2 Identifying and designing analytical procedures
5-3 Coupling scientific models with GIS
5-4 Formalizing a procedure design

DA6 Application design
6-1 Workflow analysis and design
6-2 User interfaces
6-3 Development environments for geospatial applications
6-4 Computer-Aided Software Engineering (CASE) tools

DA7 System implementation
7-1 Implementation planning
7-2 Implementation tasks
7-3 System testing
7-4 System deployment

Data Modeling

DM1 Basic storage and retrieval structures
1-1 Basic data structures
1-2 Data retrieval strategies

DM2 Database management systems
2-1 Coevolution of DBMS and GIS
2-2 Relational DBMS
2-3 Object-oriented DBMS
2-4 Extensions of the relational model

DM3 Tessellation data models
3-1 Grid representations
3-2 The raster model
3-3 Grid compression methods
3-4 The hexagonal model
3-5 The Triangulated Irregular Network (TIN) model
3-6 Resolution
3-7 Hierarchical data models

DM4 Vector and object data models
4-1 Geometric primitives
4-2 The spaghetti model
4-3 The topological model
4-4 Classic vector data models
4-5 The network model
4-6 Linear referencing
4-7 Object-based spatial databases

DM5 Modeling 3D, uncertain, and temporal phenomena
5-1 Spatio-temporal GIS
5-2 Modeling uncertainty
5-3 Modeling three-dimensional entities

Data Manipulation

DN1 Representation transformation
1-1 Impacts of transformations
1-2 Data model and format conversion
1-3 Interpolation
1-4 Vector-to-raster and raster-to-vector conversions
1-5 Raster resampling
1-6 Coordinate transformations

DN2 Generalization and aggregation
2-1 Scale and generalization
2-2 Point, line, and area generalization
2-3 Classification and transformation of attribute measurement levels
2-4 Aggregation of spatial entities

DN3 Transaction management
3-1 Database change
3-2 Modeling database change
3-3 Reconciling database change
3-4 Managing versioned geospatial databases

Geocomputation

GC1 Emergence of geocomputation
1-1 Origins
1-2 Trends

GC2 Computational aspects and neurocomputing
2-1 High performance computing
2-2 Computational intelligence
2-3 Non-linearity relationships and non-Gaussian distributions
2-4 Pattern recognition
2-5 Geospatial data classification
2-6 Multi-layer feed-forward neutral networks
2-7 Space-scale algorithms
2-8 Rule learning
2-9 Neural network schemes

GC3 Cellular Automata (CA)
3-1 CA Model Structure
3-2 CA Transition Rule
3-3 CA simulation and calibration
3-4 Integration of CA and other geocomputation methods
3-5 Typical CA applications

GC4 Heuristics
4-1 Greedy heuristics
4-2 Interchange heuristics
4-3 Interchange with probability
4-4 Simulated annealing
4-5 Lagrangian relaxation

GC5 Genetic algorithms (GA)
5-1 GA and global solutions
5-2 Genetic algorithms and artificial genomes

GC6 Agent-based models
6-1 Structure of agent-based models
6-2 Specification of agent-based models
6-3 Adaptive agents
6-4 Microsimulation and calibration of agent activities
6-5 Encoding agent-based models

GC7 Simulation modeling
7-1 Simulation modeling

GC8 Uncertainty
8-1 Conceptual model of uncertainty
8-2 Error
8-3 Problems of scale and zoning
8-4 Propagation of error in geospatial modeling
8-5 Theory of error propagation
8-6 Problems of currency, source, and scale

GC9 Fuzzy sets
9-1 Fuzzy logic
9-2 Fuzzy measures
9-3 Fuzzy composition operators
9-4 Standardization
9-5 Weighting schemes

Geospatial Data

GD1 Earth geometry
1-1 History of understanding Earth's shape
1-2 Geoids
1-3 Spheres and ellipsoids

GD2 Land partitioning systems
2-1 Unsystematic methods
2-2 Systematic methods

GD3 Georeferencing systems
3-1 Geographic coordinate system
3-2 Plane coordinate systems
3-3 Tessellated referencing systems
3-4 Linear referencing systems

GD4 Datums
4-1 Horizontal datums
4-2 Vertical datums

GD5 Map projections
5-1 Map projection properties
5-2 Map projection classes
5-3 Map projection parameters
5-4 Georegistration

GD6 Data quality
6-1 Geometric accuracy
6-2 Thematic accuracy
6-3 Resolution
6-4 Precision
6-5 Primary and secondary sources

GD7 Land surveying and GPS
7-1 Survey theory and electro-optical methods
7-2 Land records
7-3 Global Positioning System

GD8 Digitizing
8-1 Tablet digitizing
8-2 On-screen digitizing
8-3 Scanning and automated vectorization

GD9 Field data collection
9-1 Sample size selection
9-2 Spatial sample types
9-3 Sample intervals
9-4 Field data technologies

GD10 Aerial imaging and photogrammetry
10-1 Nature of aerial image data
10-2 Platforms and sensors
10-3 Aerial image interpretation
10-4 Stereoscopy and orthoimagery
10-5 Vector data extraction
10-6 Mission planning

GD11 Satellite and shipboard remote sensing
11-1 Nature of multispectral image data
11-2 Platforms and sensors
11-3 Algorithms and processing
11-4 Ground verification and accuracy assessment
11-5 Applications and settings

GD12 Metadata, standards, and infrastructures
12-1 Metadata
12-2 Content standards
12-3 Data warehouses
12-4 Exchange specifications
12-5 Transport protocols
12-6 Spatial Data Infrastructures

GIS&T and Society

GS1 Legal aspects
1-1 The legal regime
1-2 Contract law
1-3 Liability
1-4 Privacy

GS2 Economic aspects
2-1 Economics and the role of information
2-2 Valuing and measuring benefits
2-3 Models of benefits
2-4 Agency, organizational, and individual perspectives
2-5 Measuring costs

GS3 Use of geospatial information in the public sector
3-1 Uses of geospatial information in government
3-2 Public participation in governing
3-3 Public participation GIS

GS4 Geospatial information as property
4-1 Property regimes
4-2 Mechanisms of control of geospatial information
4-3 Enforcing control

GS5 Dissemination of geospatial information
5-1 Incentives and barriers to sharing geospatial information
5-2 Data sharing among organizations and individuals
5-3 Legal mechanisms for sharing geospatial information
5-4 Balancing security and open access to geospatial information

GS6 Ethical aspects
6-1 Ethics and geospatial information
6-2 Codes of ethics for geospatial professionals

GS7 Critical GIS
7-1 Epistemological critiques
7-2 Ethical critiques
7-3 Feminist critiques
7-4 Social critiques

Organizational & Institutional Aspects

OI1 Origins of GIS&T
1-1 Public sector origins
1-2 Private sector origins
1-3 Academic origins
1-4 Learning from experience
1-5 Future trends

OI2 Managing the GI system operations and infrastructure
2-1 Managing the GI system operations and infrastructure
2-2 Ongoing GI system revision
2-3 Budgeting for GI system management
2-4 Database administration
2-5 System management
2-6 User support

OI3 Organizational structures and procedures
3-1 Organizational models for GI system management
3-2 Organizational models for coordinating GI systems and/or program participants and stakeholders
3-3 Integrating GIS&T with management information systems (MIS)

OI4 GIS&T workforce themes
4-1 GIS&T staff development
4-2 GIS&T positions and qualifications
4-3 GIS&T training and education
4-4 Incorporating GIS&T into existing job classifications

OI5 Institutional and inter-institutional aspects
5-1 Spatial data infrastructures
5-2 Adoption of standards
5-3 Technology transfer
5-4 Spatial data sharing among organizations
5-5 Openness
5-6 Balancing data access, security, and privacy
5-7 Implications of distributed GIS&T
5-8 Interorganizational and vendor GI systems

OI6 Coordinating organizations
6-1 Federal agencies and national and international organizations and programs
6-2 State and regional coordinating bodies
6-3 Professional organizations
6-4 Publications
6-5 The geospatial community
6-6 The geospatial Industry

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USGIF

The United States Geospatial Intelligence Foundation (USGIF) is the only organization dedicated to promoting the geospatial intelligence tradecraft and building a stronger community of interest across industry, academia, government, professional organizations and individual stakeholders.

As a not-for-profit educational foundation, USGIF strives to bring together the community at-large and support life-long learning that will ensure a robust cadre of professionals and a healthy tradecraft now and in the future.

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What's New:

USGIF Seeks Outreach Coordinator
USGIF is looking for a full-time Outreach Coordinator to manage existing relationships with USGIF partners while cultivating new opportunities with academia, government, industry and professional organizations. Visit the link above to find out more about the position and how to apply.

USGIF Young Professionals Survey Deadline Extended!
The deadline to take the USGIF Yound Professionals Survey has been extended until Friday, Sept. 19. USGIF is reaching out to Young Professionals throughout the Community to find out how we can provide

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Oct. 27 - 30, 2008 in Nashville, TN

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GISCIENCE 2008
Fifth International Conference on Geographic Information Science
September 23-26, Park City, Utah
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Introduction
Dates and Location
Accommodations
Travel Info
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Past Conferences
Past Conferences
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GIScience 2006
Fourth International Conference on Geographic Information Science
Schloss M ünster, Meunster, Germany
View GIScience 2006 website
GIScience 2004
Third International Conference on Geographic Information Science
University of Maryland Conference Center
View GIScience 2004 website
GIScience 2002
Second International Conference on Geographic Information Science
Millennium Hotel Boulder, Colorado, USA
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GIScience 2000
First International Conference on Geographic Information Science
Savannah Marriott Riverfront, Savannah, Georgia, USA
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08.08 Digital Globes Panel
08.08 Registration Up
08.08 Schedule
07.08 Travel scholarships
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05.08 Accepted Papers
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GeoComputation

The Art and Science of Solving Complex Spatial Problems with Computers.

Detailed Definition

Conference Aims

Steering Group

News

Join our revamped Mailing list

The GeoComputation community has centred itself around a series of international research conferences initiated in 1996. The conference moves to a different location each year; so far alternating between Europe and either North America or the Antipodes. This site maintains papers and other information from previous conferences and links to upcoming conferences.

Upcoming

Our 2009 conference will be at the University of New South Wales, AUS. For details, please contact Dr Shawn Laffan.

From 2002 GeoComp has alternated every alternate year with GIScience.

Paper archives for previous conferences

GeoComputation '07	National University of Ireland, Maynooth, Eire
GeoComputation '05	University of Michigan, Michigan, USA
GeoComputation '03	University of Southampton, United Kingdom
GeoComputation '01	University of Queensland, Brisbane, Australia
GeoComputation '00	University of Greenwich, Medway Campus, United Kingdom.
GeoComputation '99	Mary Washington College, Virginia, USA.
GeoComputation '98	University of Bristol, Bristol, United Kingdom.
GeoComputation '97	University of Otago, Dunedin, New Zealand.
GeoComputation '96	University of Leeds, Leeds, United Kingdom.

3) 考え方，方法論の転換

- モデル駆動からデータ駆動へ
- 集計的思考から非集計的思考へ
- 空間解析から時空間解析へ
- 関係性の解明へ
- パターンからプロセスの解明へ，そして予測へ

モデル駆動からデータ駆動へ

- モデル駆動 (model-driven)

  演繹的･規範的思考，仮説検証にGISを用いる

  ゴミを入れてもゴミしか出てこない

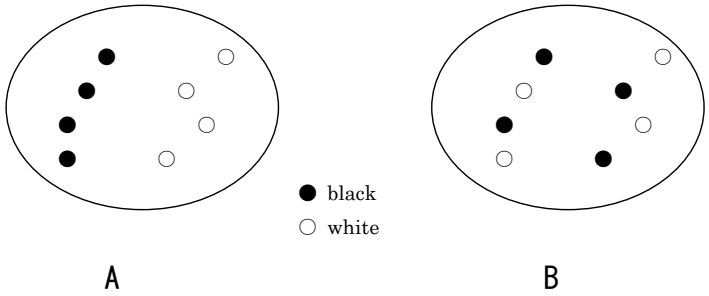
- データ駆動 (data-driven)

  帰納的･探索的思考，仮説構築にGISを用いる

  ゴミの中からダイアモンドを見つける

集計的思考から非集計的思考へ

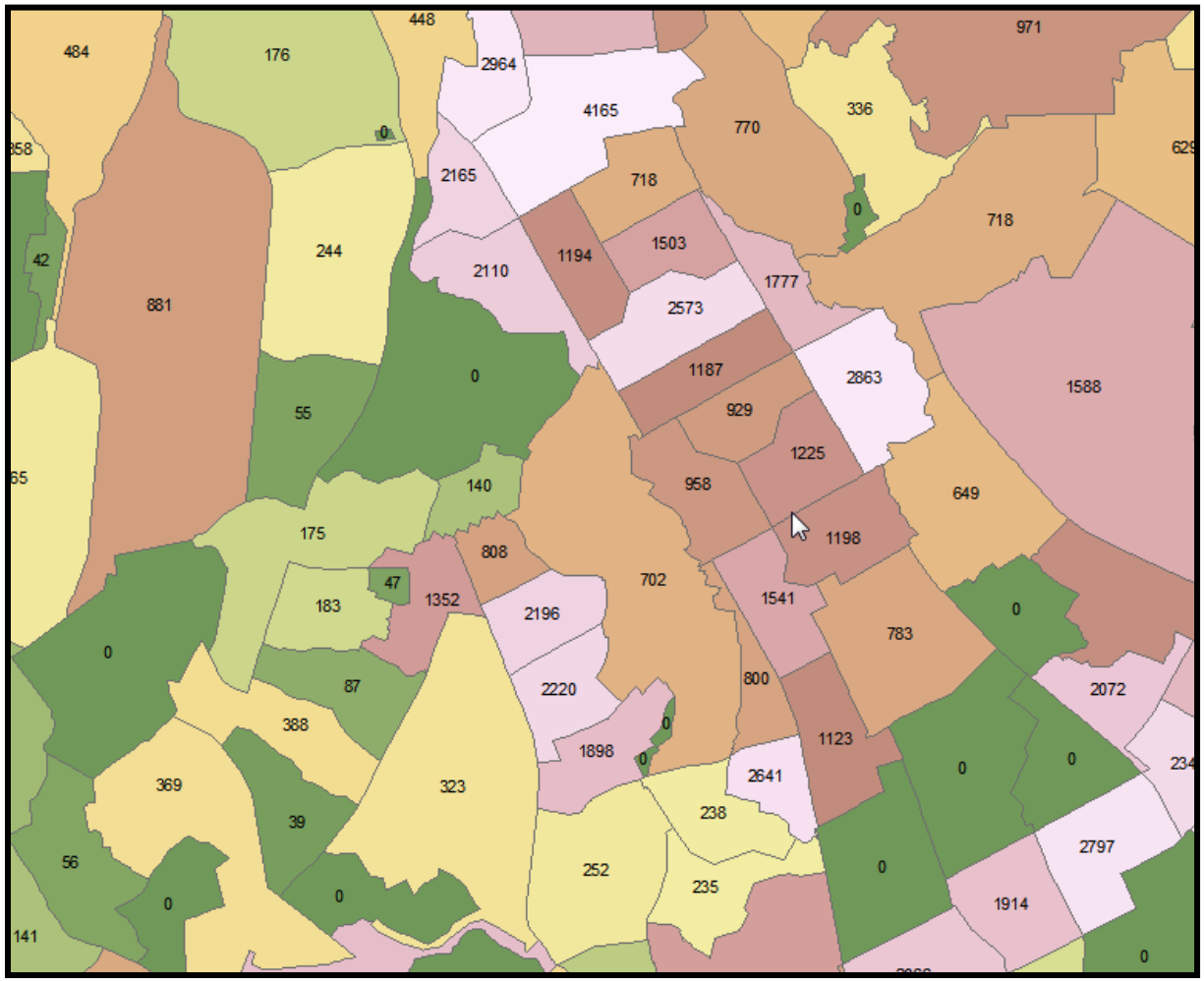
- 集計的思考
  - 総量を重視する
  - 平均値が意味をなす世界
- 非集計的思考
  - 個々の特性を重視する
  - 平均値が意味をなさない世界



空間的セグリゲーション

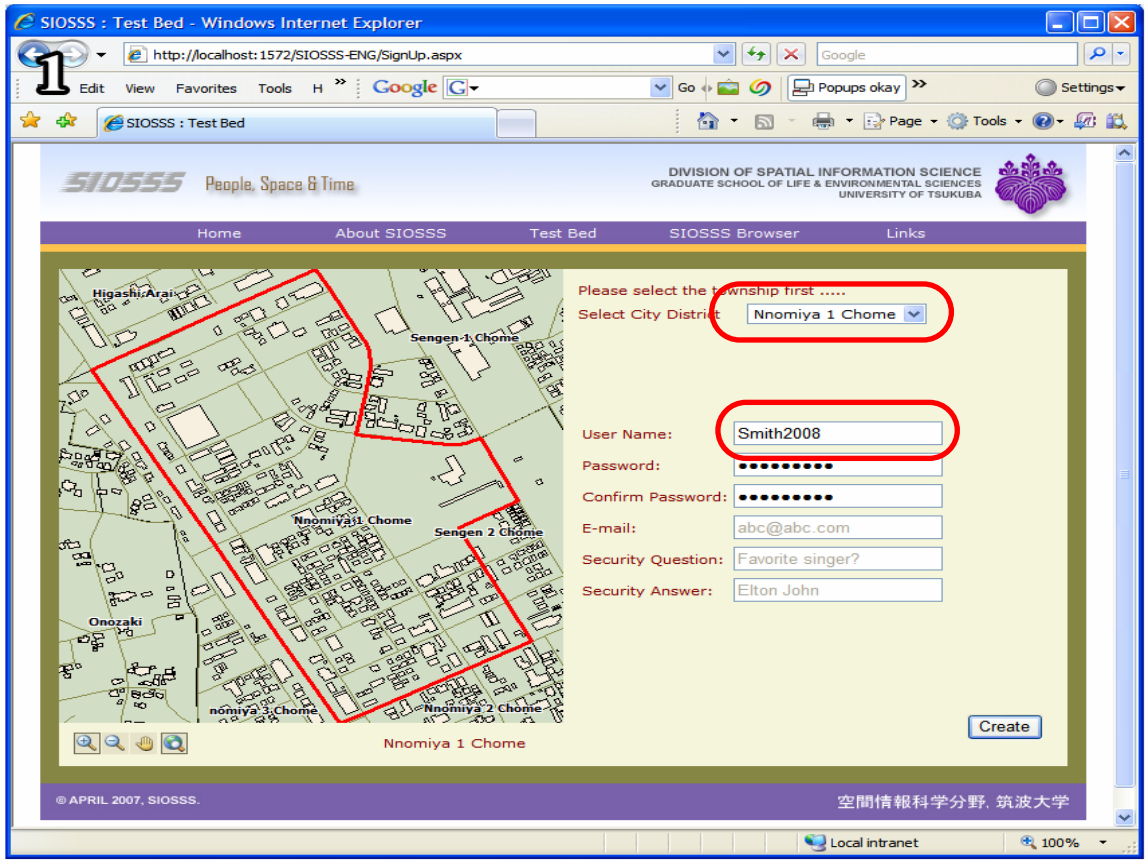
Aggregated spatial analysis

Choropleth mapping



Source: Ko Ko, 2008.

Problems in aggregated spatial analysis



Source: Ko Ko, 2008.

Estimating the building population

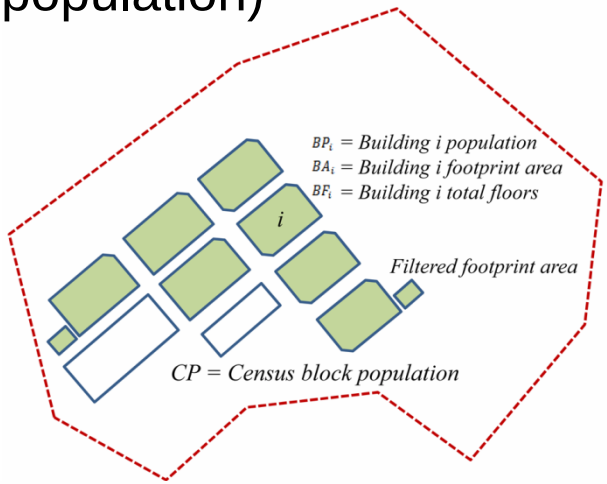
Assumption (Estimation of building population)

Areametric method

$$BP_i = \left(\frac{CP}{\sum_{i=1}^{n} BA_i}\right) BA_i$$

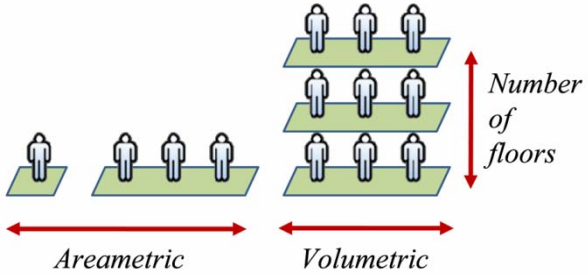
Volumetric method

$$BP_i = \left(\frac{CP}{\sum_{i=1}^{n} BA_i . BF_i}\right) BA_i . BF_i$$



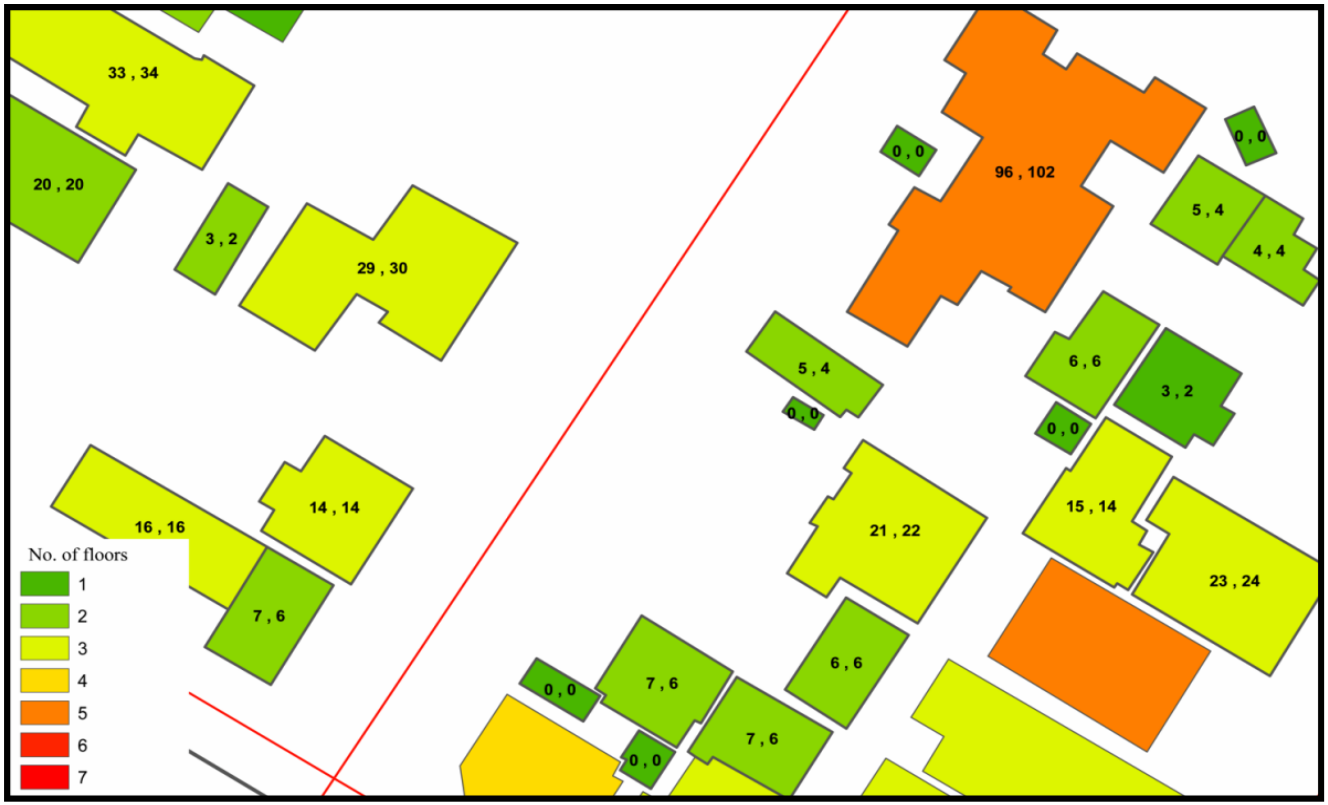
Where:

BP_i	:	Population of building i
CP	:	Census tract population
BA_i	:	Footprint area of building i
BF_i	:	Number of floors of building i
i	:	Index (increasement)
n	:	Number of buildings which meet user defined criteria and fall inside the polygon of CP



Source: Ko Ko, 2008.

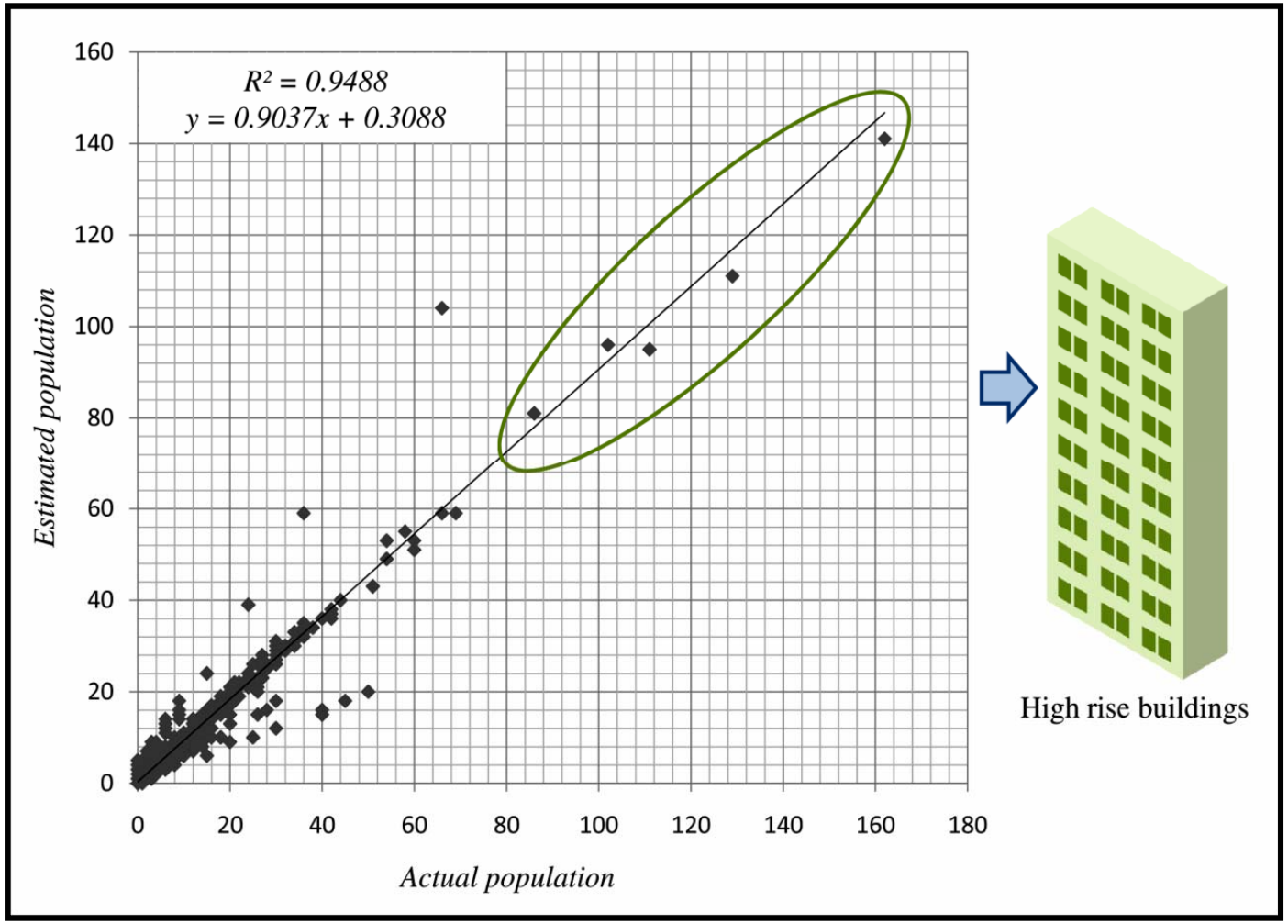
Results



Estimated populations (left value) vs. actual populations (right value) in high rise building area (Filtered area 25 m^2, Volumetric Method applied to residential building)

Source: Ko Ko, 2008.

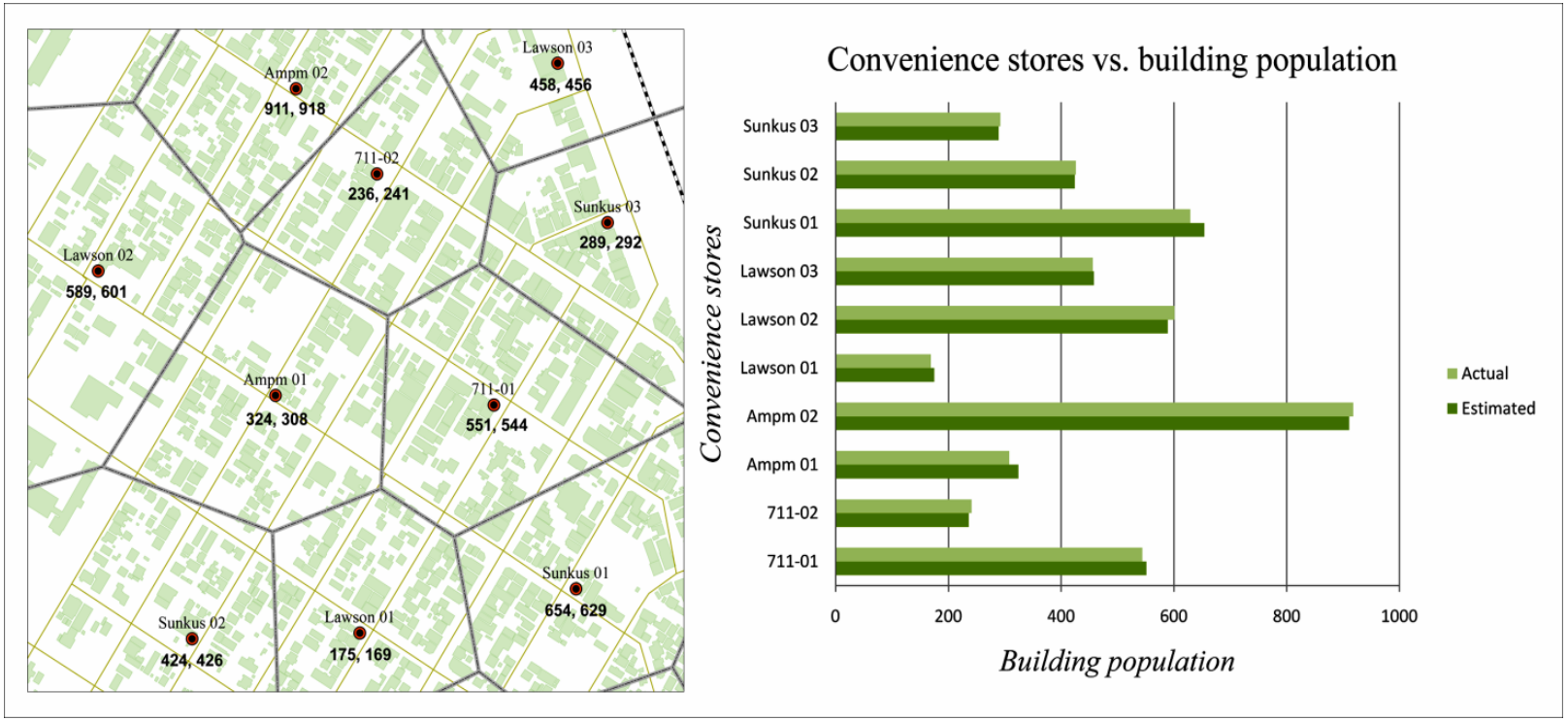
Accuracy assessment



Scatter plot for 25 m² filtered area in Volumetric Method (Total sample size = 8854)

Source: Ko Ko, 2008.

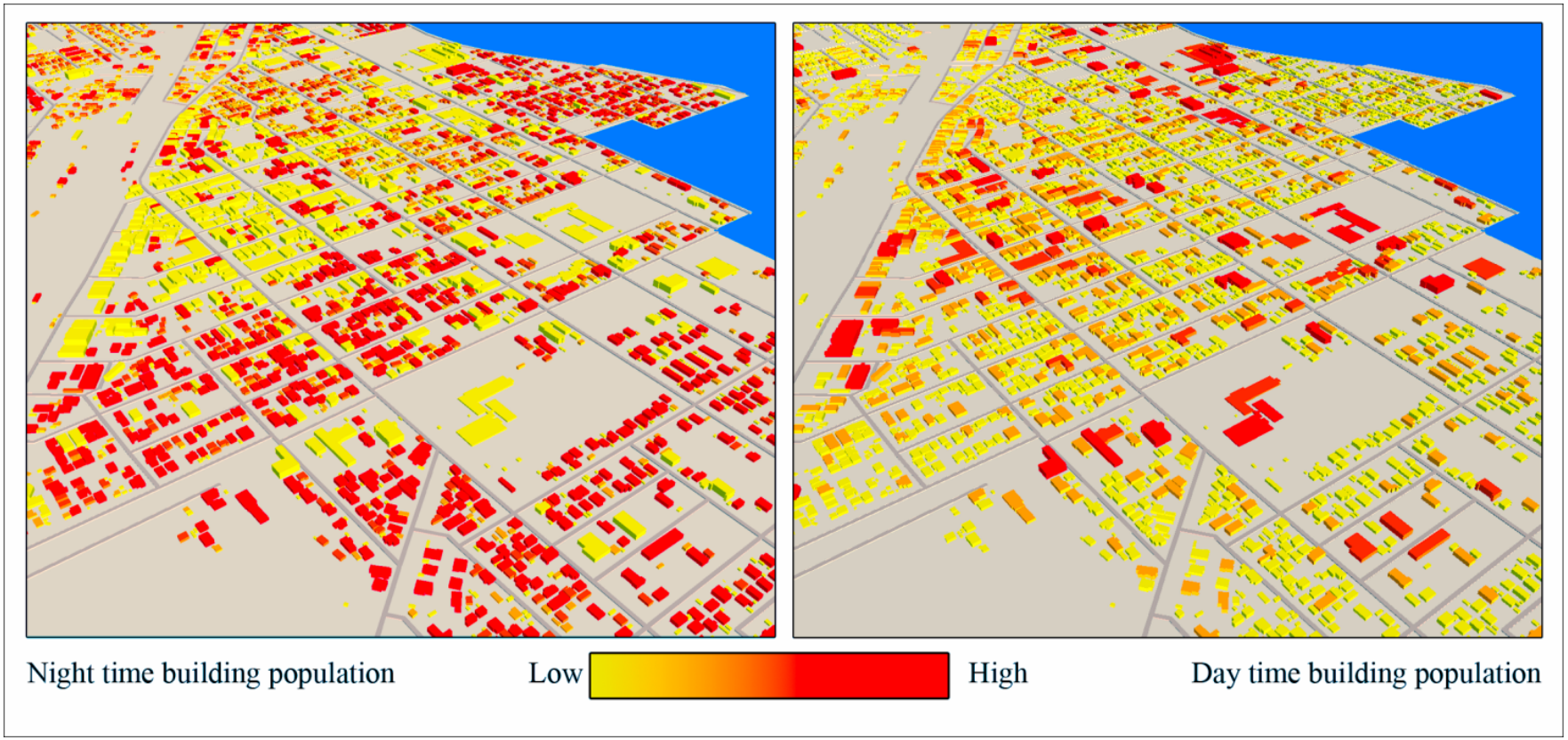
Potential applications of non-aggregated data



Use of building population in market competition analysis
(24 hours convenience stores (mini stores) vs. neighboring population)

Source: Ko Ko, 2008.

Potential applications of population data



(a) Estimation of building population using residential building only for nighttime population distribution,
(b) Estimation of building population using all building use types and total census tracts used as a single unit for daytime population distribution

Source: Ko Ko, 2008.

統計法の改正（2007年，第166回通常国会）

「行政のための統計」から
「社会の情報基盤としての統計」へ

公的統計の体系的かつ効率的な整備及びその有用性の向上を図るため，公的統計の整備に関する基本的な計画を策定すること，統計データの二次利用を促進すること

非集計データの活用

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- 可変的地域設定
- パネル化
- クロス集計化

自発的データ提供

- Volunteered geographic information

Citizens as sensors, Goodchild, 2007

Citizen as a data producer, Elwood 2007

→ Collective Intelligence

考え方，方法論の転換

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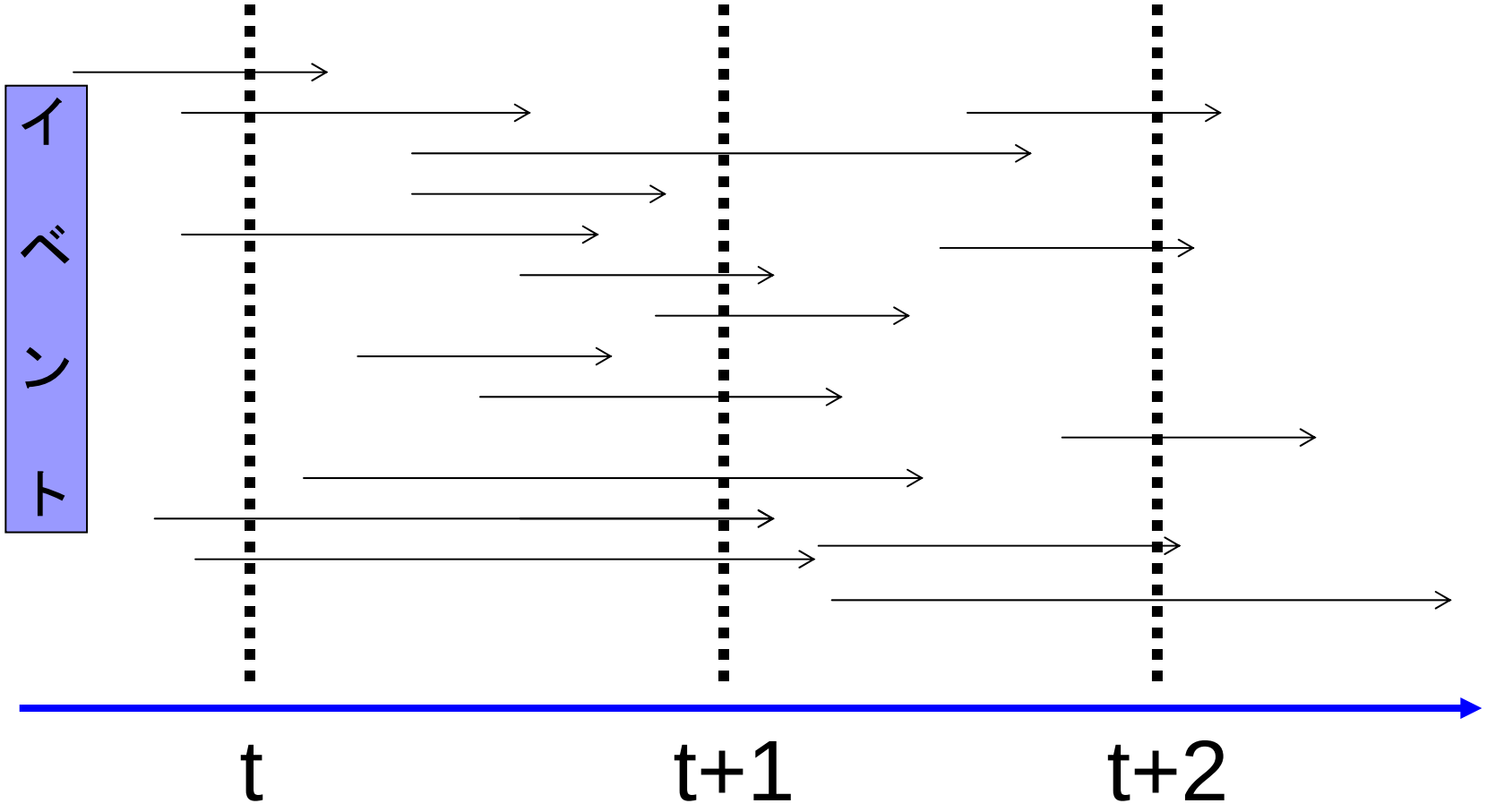
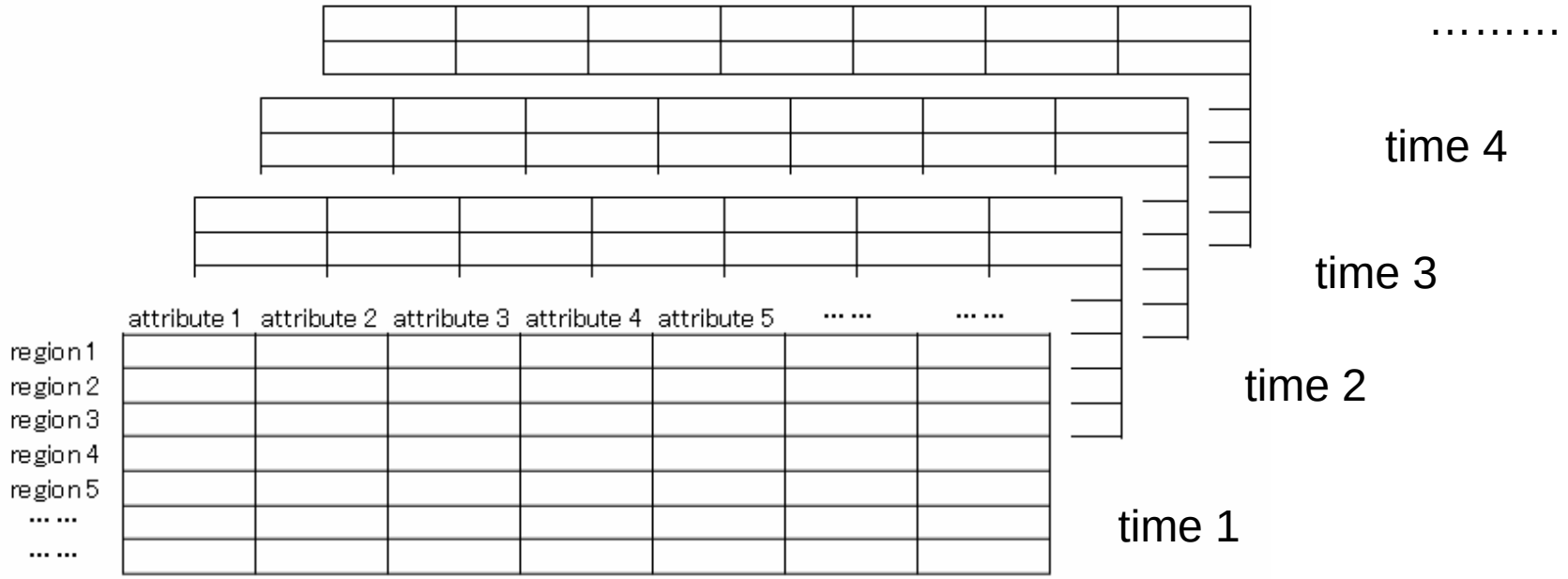
- 関係性の解明へ
- パターンからプロセスの解明へ，そして予測へ

伝統的方法 ―時間を分断―



地理行列

地域（地点）と属性と時間の管理



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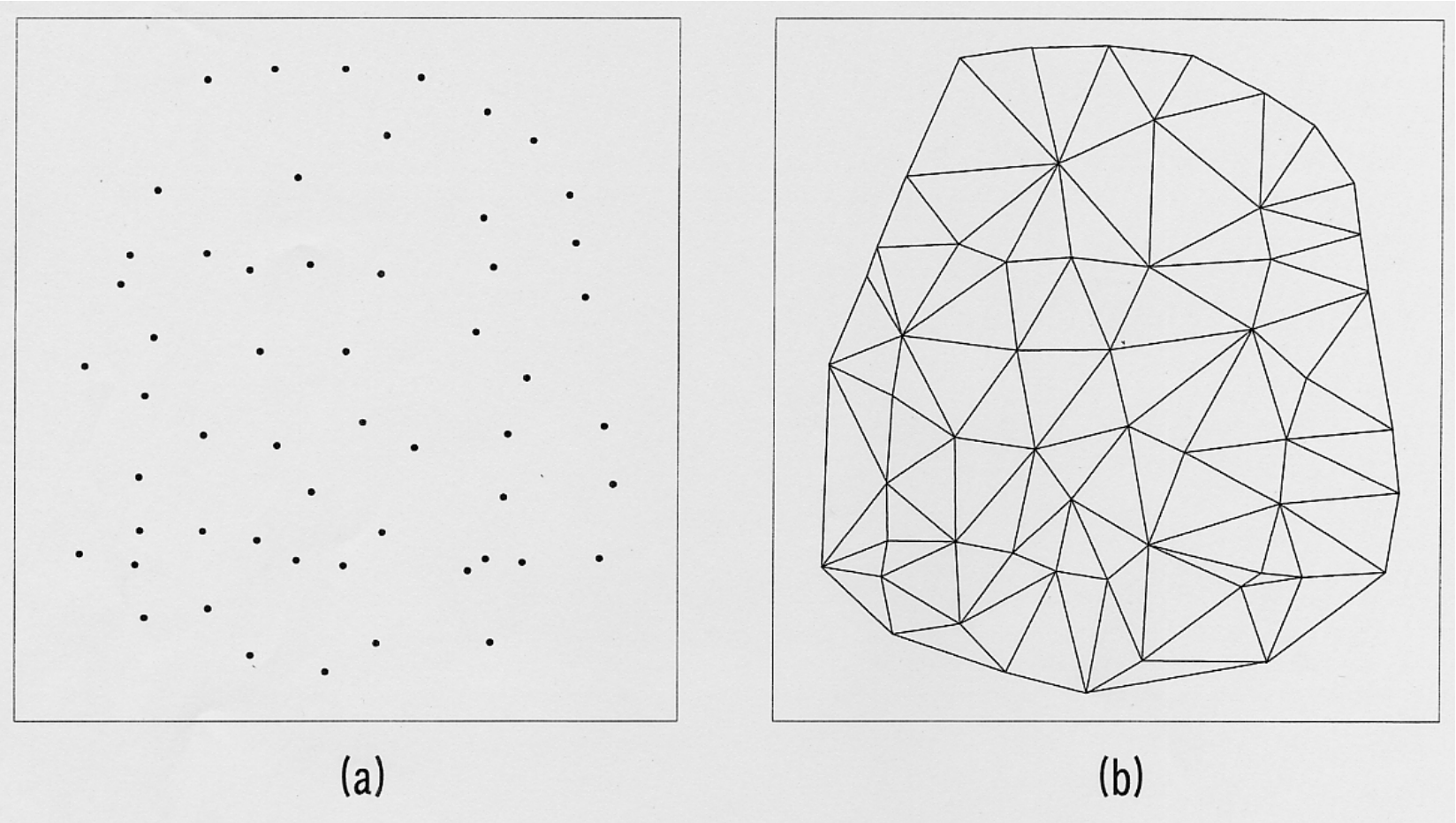
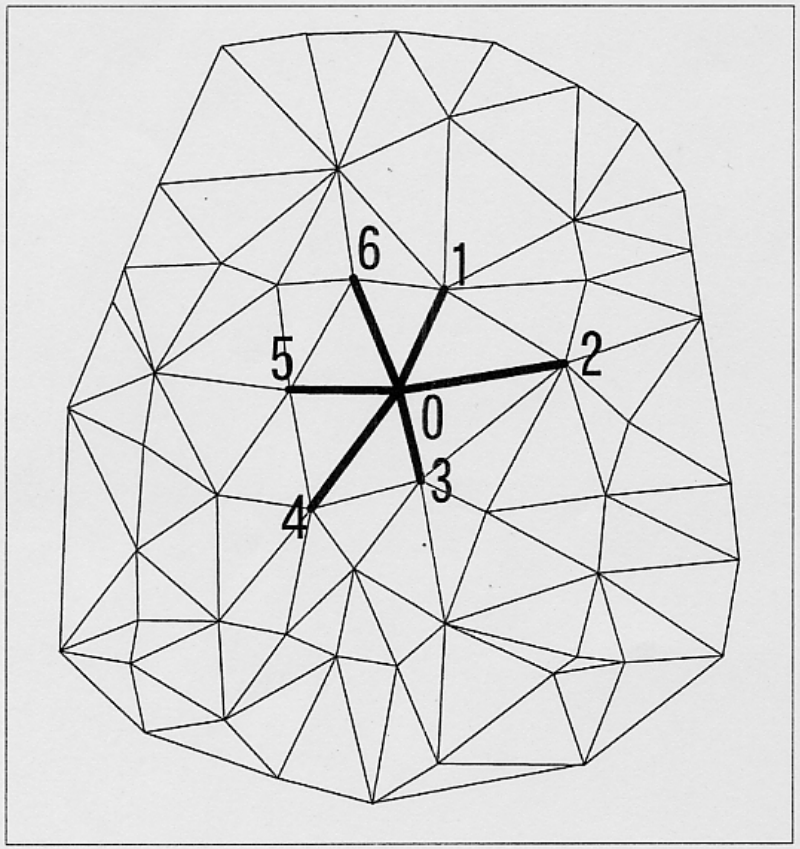
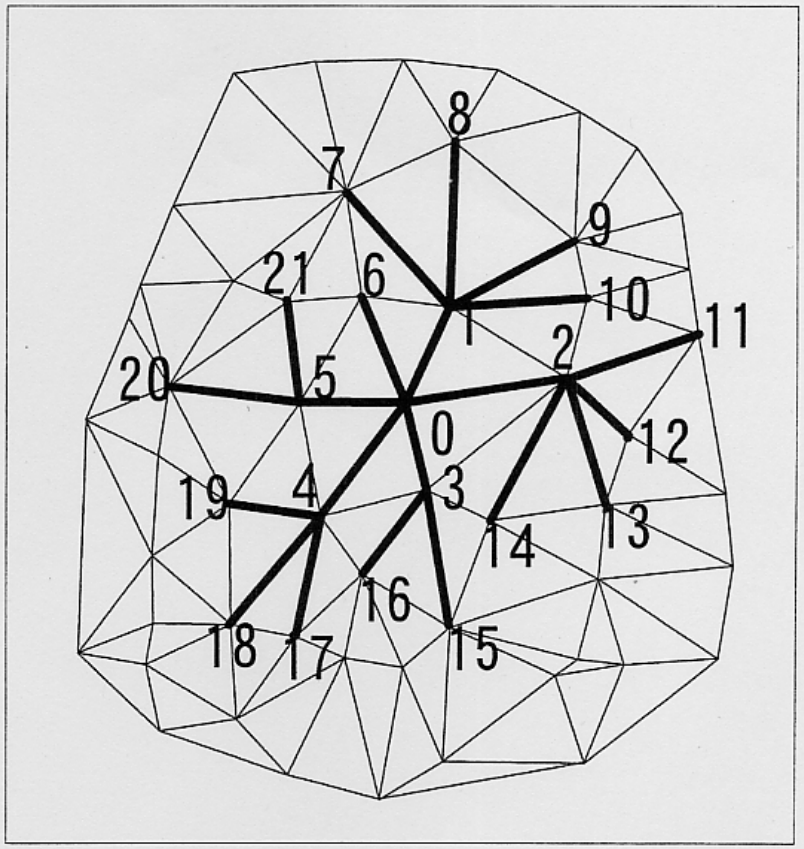

(a)
(b)



(c)



(d)

Figure 1. K-order neighbors on Delaunay triangulation.
(a) point distribution; (b) Delaunay triangulation;
(c) nearest neighbors; (d) 2-order neighbors.

考え方，方法論の転換

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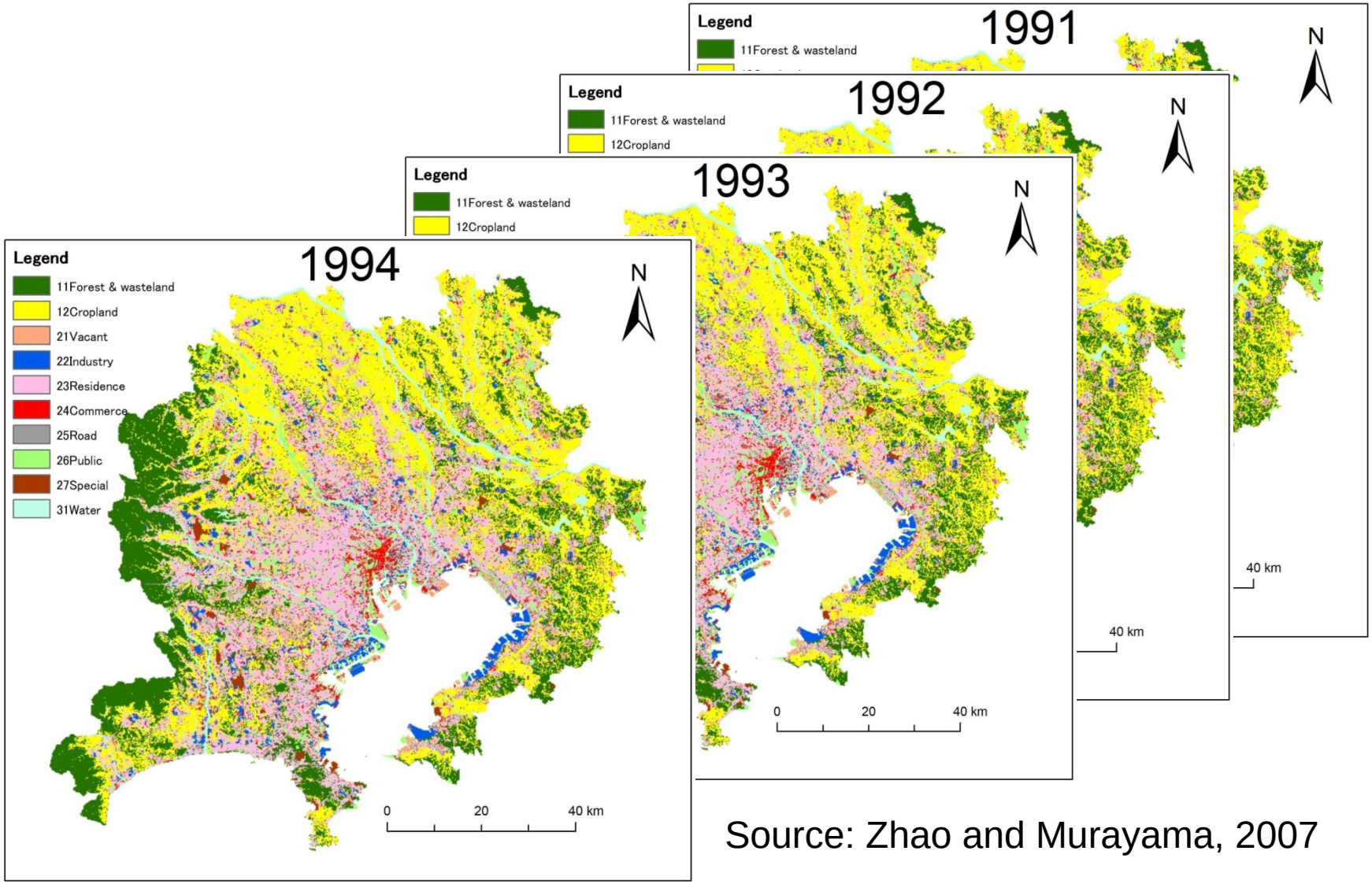
- パターンからプロセスの解明へ，そして予測へ

注目を集める新しい手法

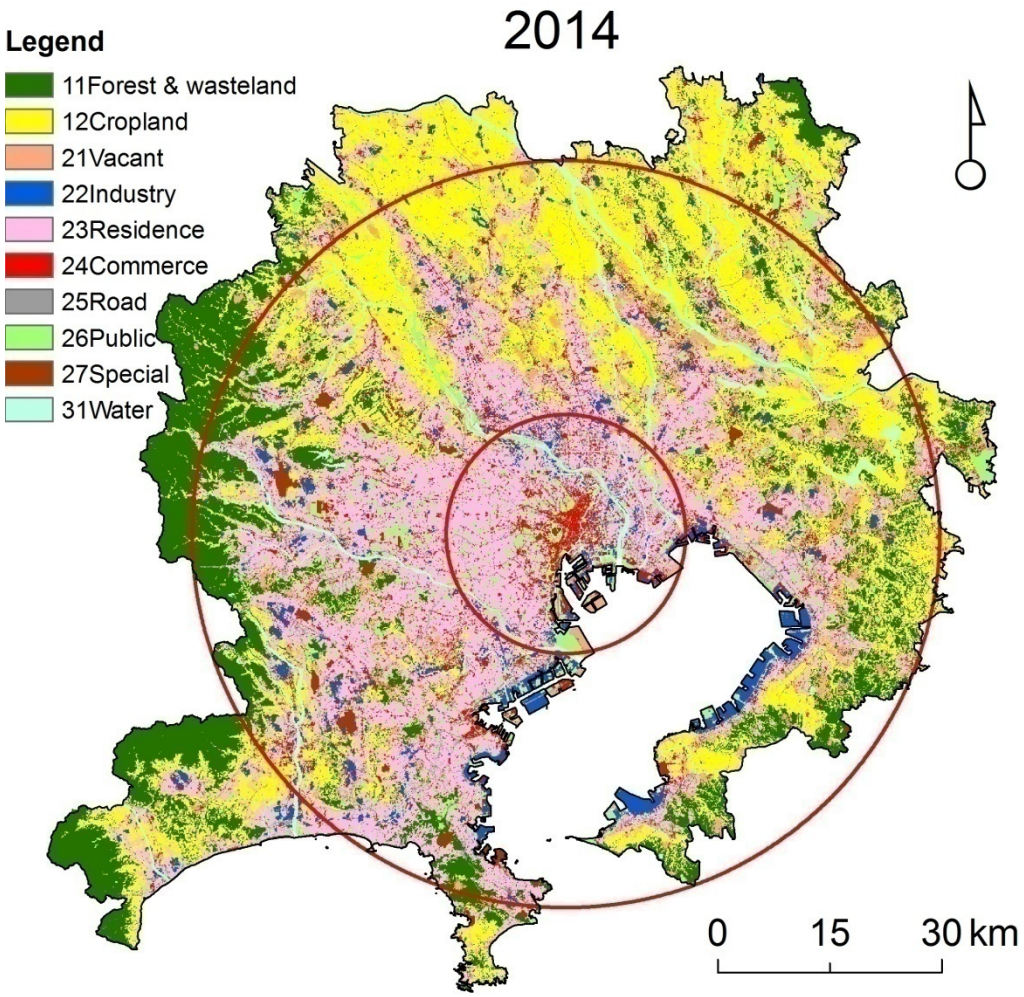
- 空間データマイニング
- 空間スキャニング
- ジオシミュレーション
- ジオコンピュテーション

Urban geosimulation



Source: Zhao and Murayama, 2007

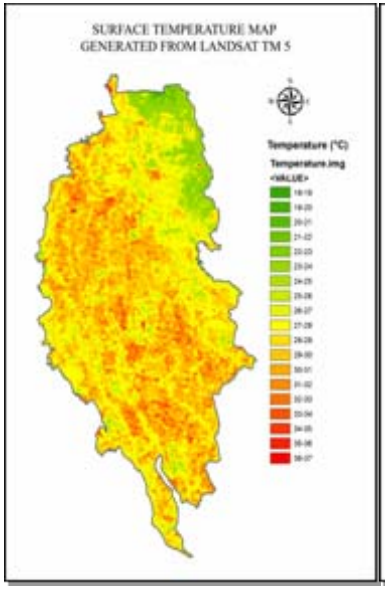
Prediction of future urban land-use

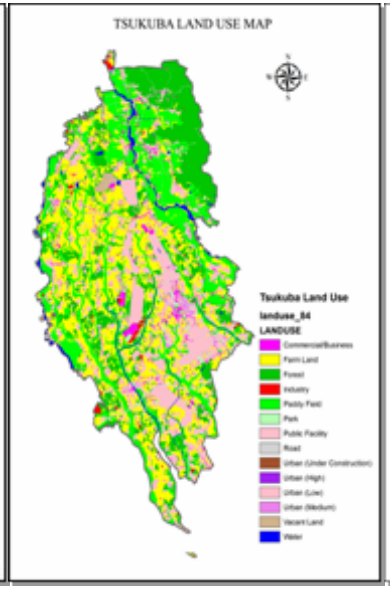


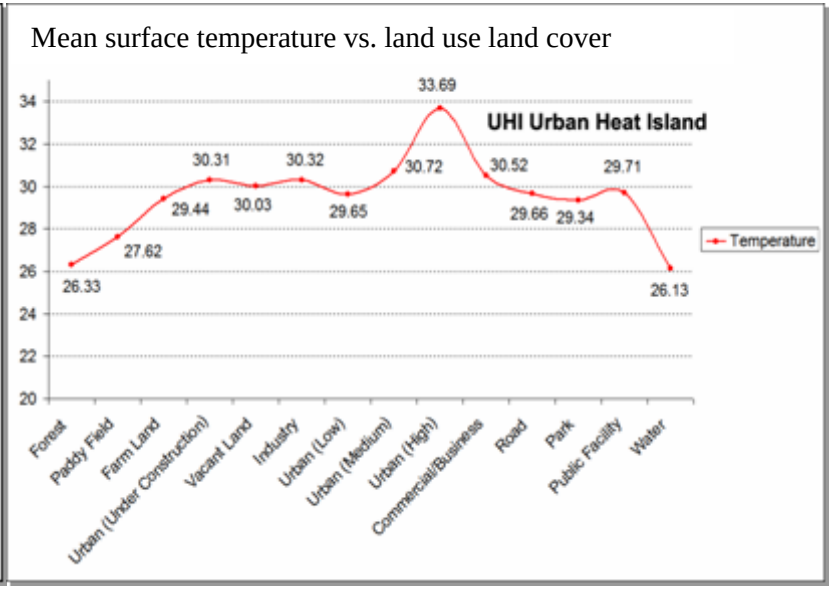
Source: Zhao and Murayama, 2007

Visualization of Urban heat island

Spatial Relationship between Satellite Generated Surface Temperature and Land Use Categories (Visualization of UHI Urban Heat Island)







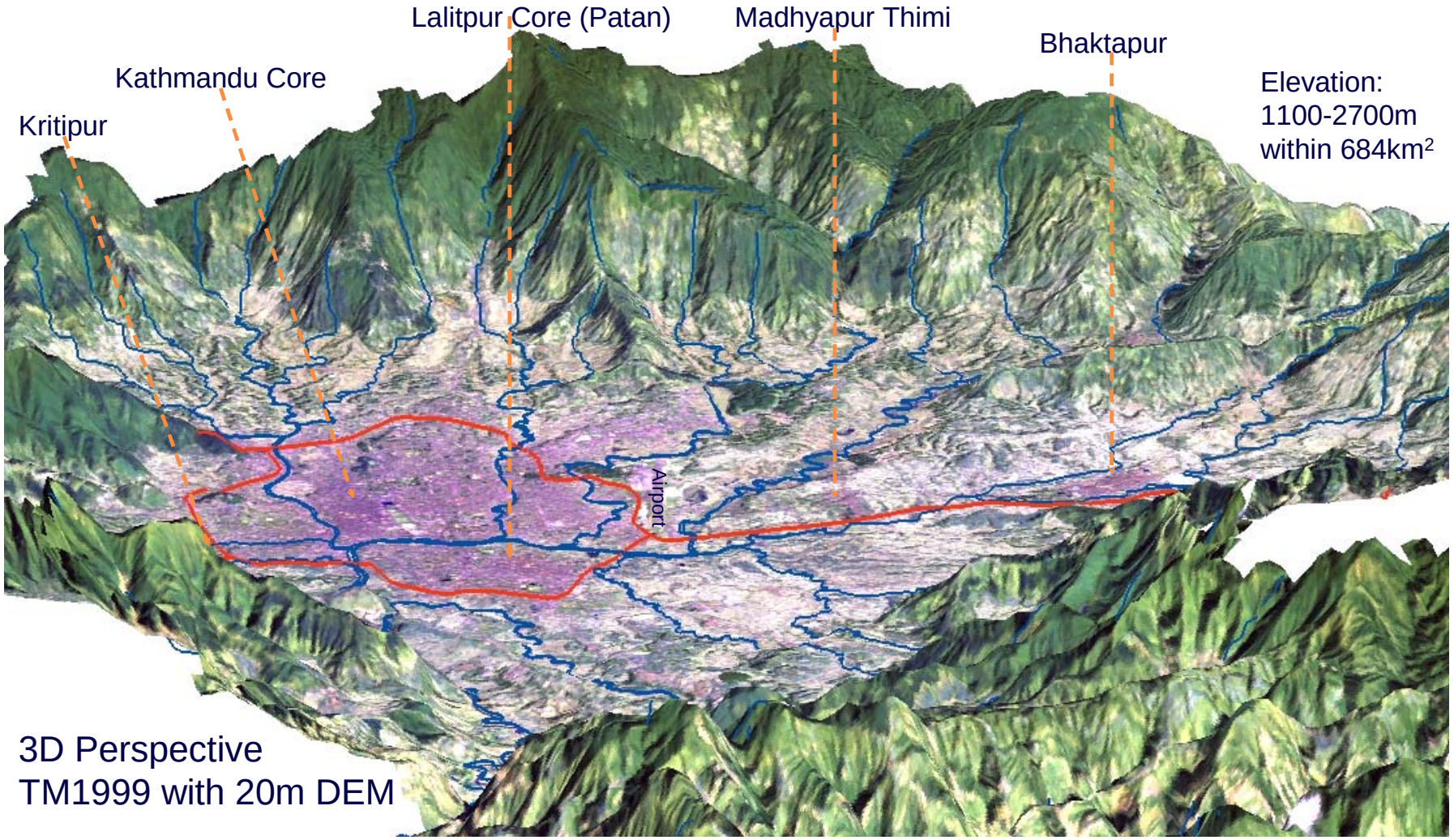
A B C

A: Tsukuba surface temperature map generated from Landsat TM5 satellite acquired by 1987-05-21, 11:00AM (JST)

B:Tsukuba Land Use Map in 1984 (Source: GSI Geographical Survey Institute, Japan)

C:Spatial relationship between surface temperature and land use categories using Zonal Statistic (Spatial Analysis)

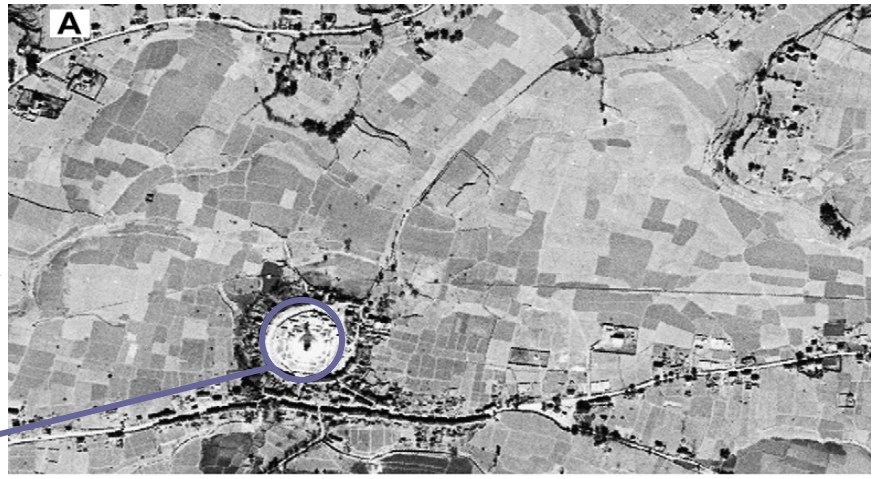
Kathmandu Valley



Source: Thapa, 2008.

Land use change process –
monitoring from satellites

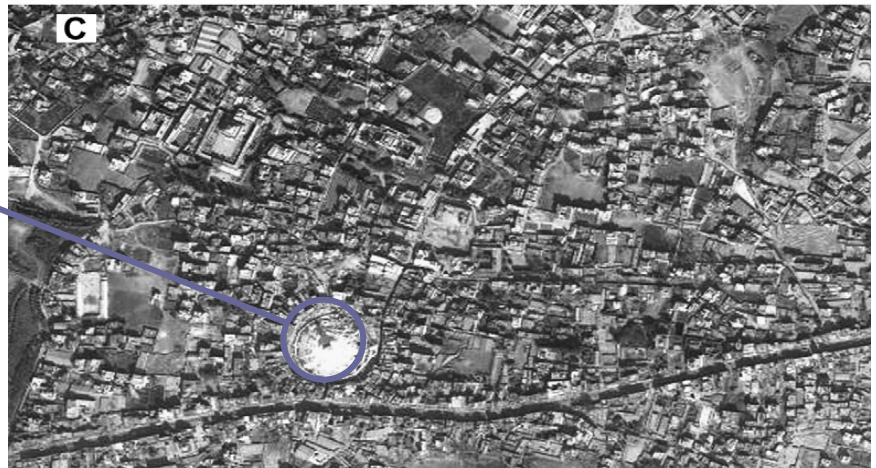
CORONA
1967



SPIN-2
1991

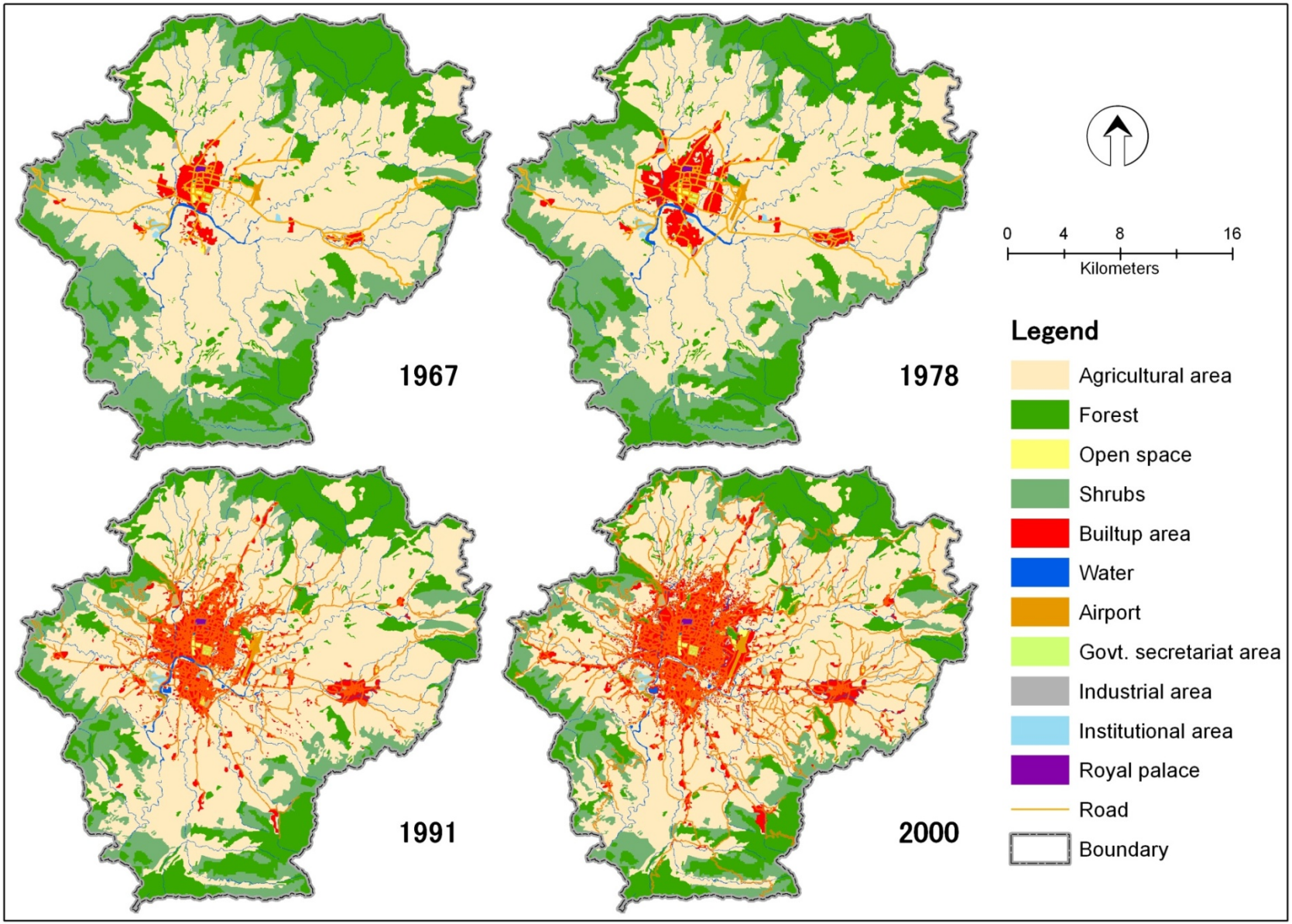
Landmark – Boudhanath Temple in Kathmandu

Google Earth



Source: Thapa, 2008.

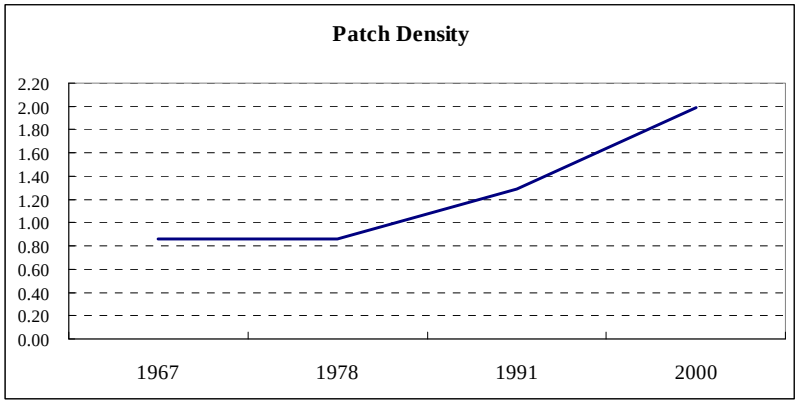
Land use maps

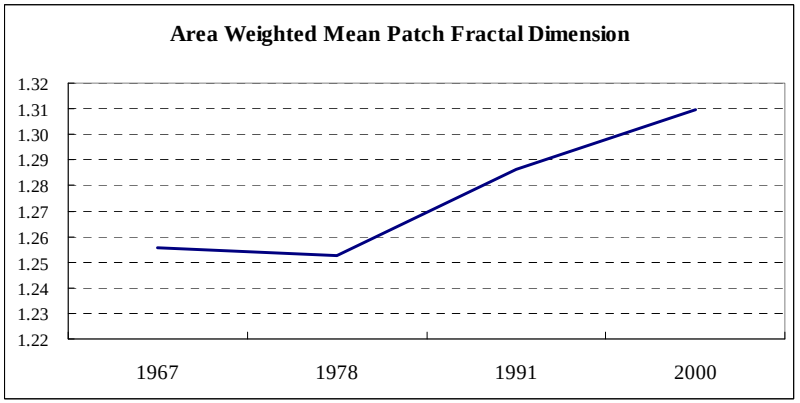


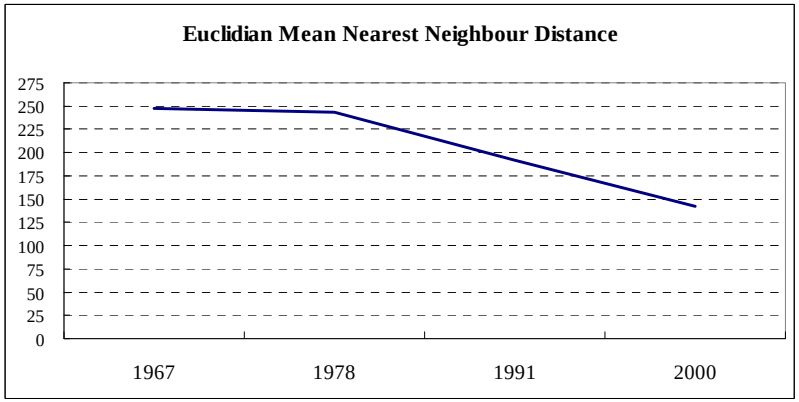
Source: Thapa, 2008.

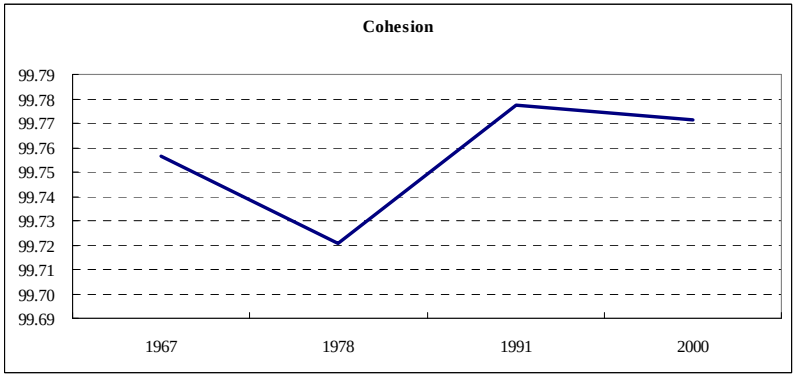
Landscape metrics

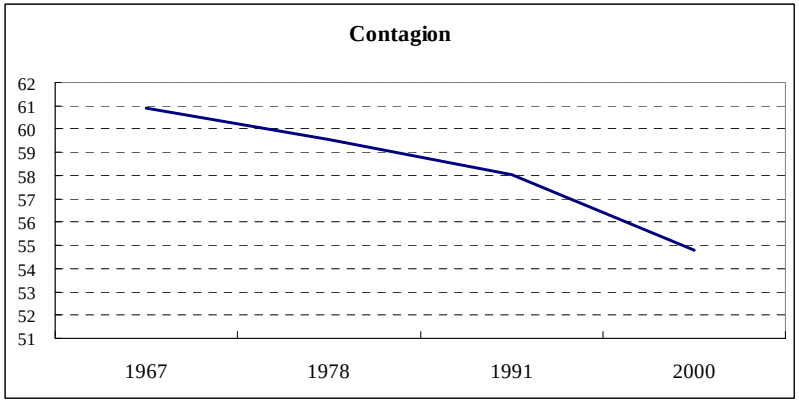
(*Source*: Thapa, 2008)

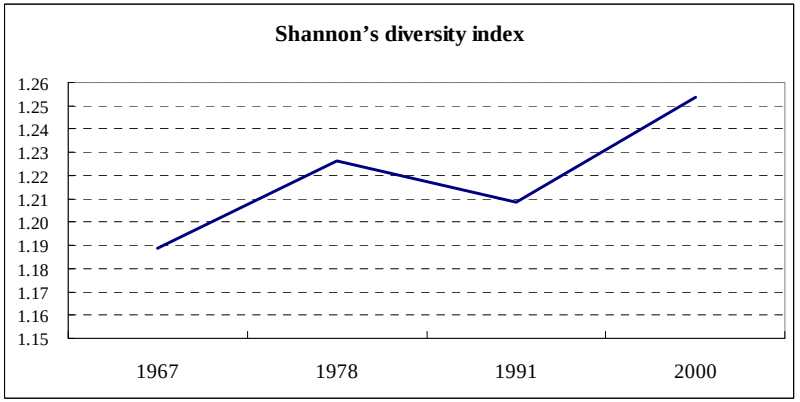




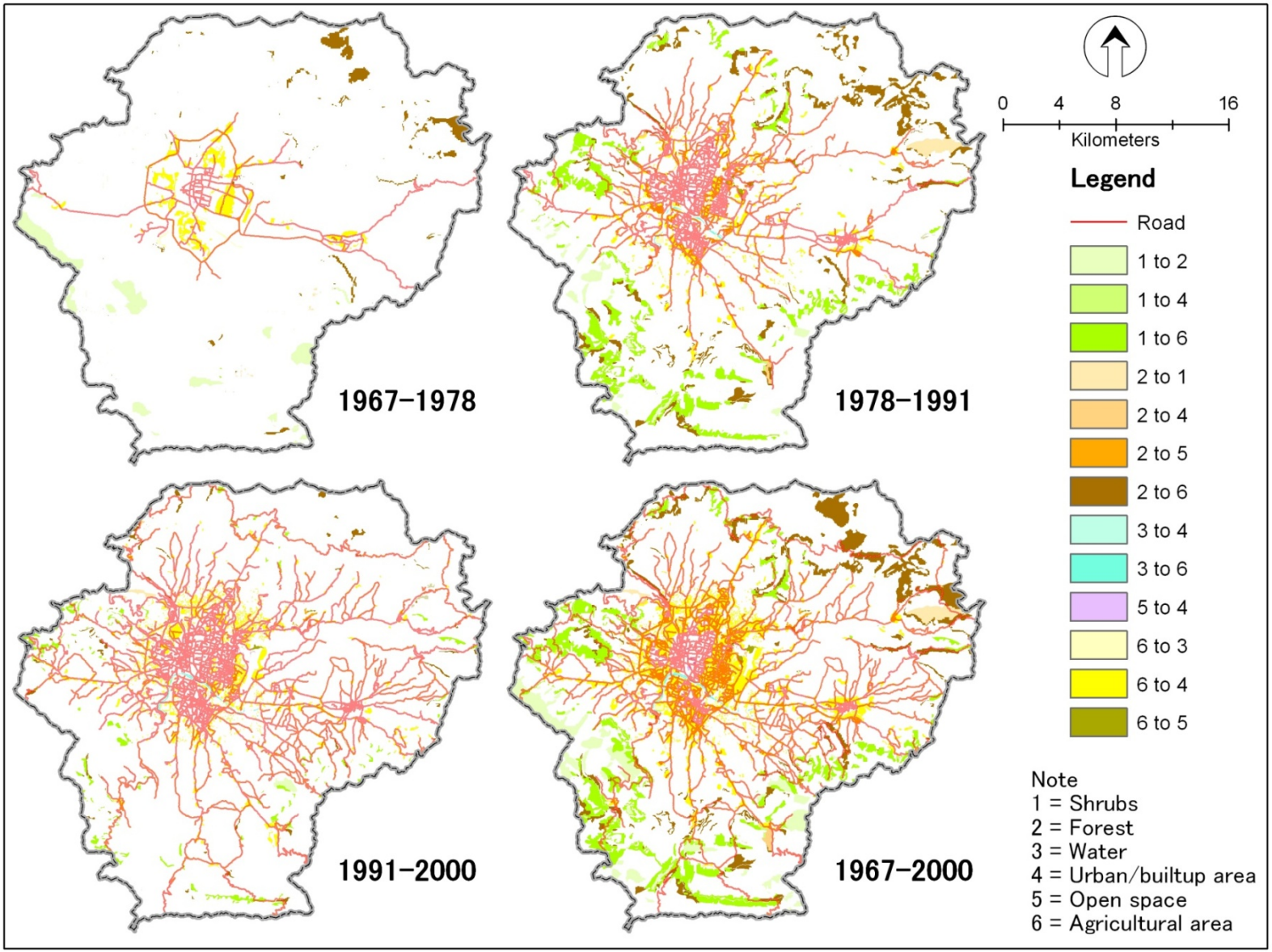








Land use results – transition maps



Source: Thapa, 2008.

4) 日本におけるGIS研究の課題と問題点

- 学問･行政の縦割り構造
- 弱い地理系と情報系の連携
- 進まない基礎と応用のコラボレーション
- 過度な欧米依存

　　―アジアにはアジアの，日本には日本のGISがある

5) これからのGIS研究

- ソフト主導からコンテンツ主導へ
- 予測（forecasting）から制御・管理（control & management）を指向する研究へ
- グローバルスタディへの貢献

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- Download CSW and WMC Extensions
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- GEO Participants
- Login

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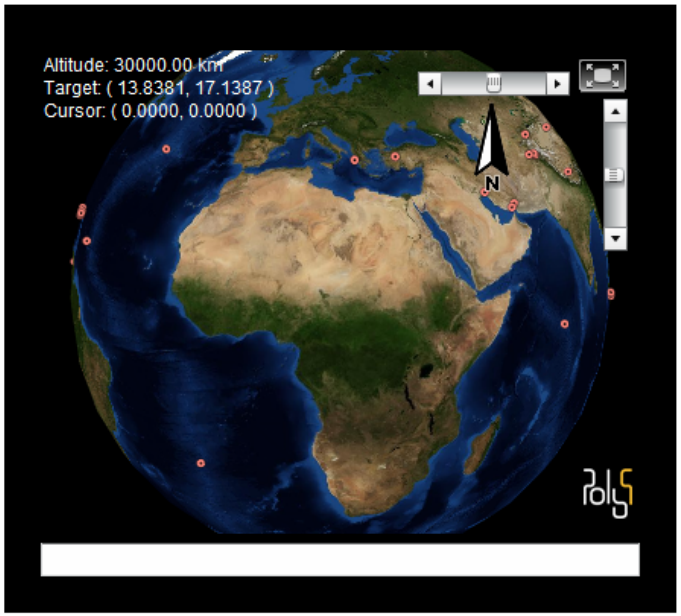
Search

Find by Place or Other Criteria

GEOGlobe: GeoRSS Viewer



Sample GeoRSS feeds (copy shortcut/paste in box above):

- EpiSPIDER (Health Alerts)
- Volcanic Ash Alerts
- Earthquakes >M2.5 within past 7 days

View GEO content in ArcGIS Explorer.

News

- Events

Societal Benefit Areas

- Agriculture
- Biodiversity
- Climate
- Disaster
- Ecosystems
- Energy
- Health
- Water
- Weather

GEOSS Scenarios

- Ecosystems & Biodiversity in Africa
- Ecosystems & Biodiversity in Polar Regions
- Oil Spill
- Regional Climate
- Volcano
- Wildland Fires in Africa

Resources

- Capacity Building
- Cartography
- Data Models
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GEONETCast

CIESIN Columbia University

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World Data Center for Human Interactions in the Environment

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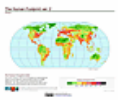
The SEDAC Portal to Global Environmental and Socioeconomic Data

The CIESIN World Data Center

This portal, hosted by NASA's Socioeconomic Data and Applications Center (SEDAC), provides access to a wide range of global data, associated documentation, and visualization and analysis tools, and to the community of experts on global data.

Recent Data Set Release

Species Distribution Grids
Web site



The Human Footprint/The Last of the Wild
Web site

2008 Environmental Performance Index (EPI)
Web site | Press Release | Profile

News

Species Data Reveal Areas of High Biodiversity in the Americas, the World
Web site

Updated Human Footprint Data Now Available
Web site

New Study in *Nature* Maps Global Hotspots of Emerging Diseases
Article

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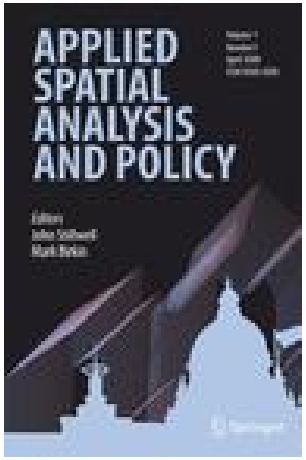

Applied Spatial Analysis and Policy

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Description

Applied Spatial Analysis and Policy draws on spatial analysis for the assembly and interpretation of evidence, addressing such issues as crime and deprivation, immigration and demographic restructuring, retail activity and employment change, resource management and environmental improvement.

The journal draws on applied research from such sources as transport, policing, education, health, environment and leisure to offer comparative policy analysis between domains and locations, and to stimulate ideas on the application of spatial analysis methods across varied policy contexts.

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