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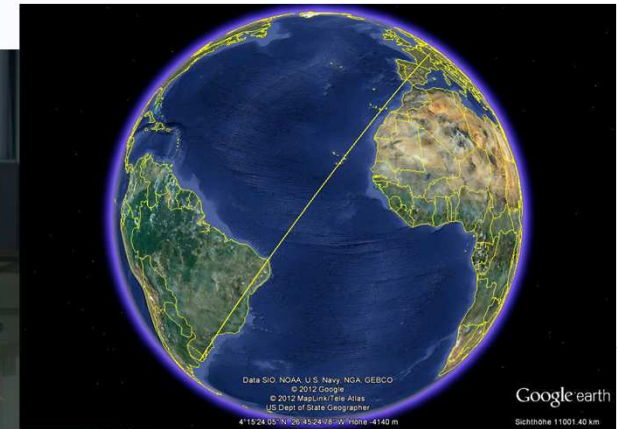
# ***Some Considerations on Sub-National Spatial Data Infrastructures***

*Hartmut Müller and Falk Würriehausen*

8th FIG Regional Conference,  
Surveying towards Sustainable Development  
26-29 November 2012, Montevideo, Uruguay

*Technical Session 02C – SDI - Spatial Data Infrastructure, 26 Nov 2012*

*Paper no 6390*



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# Spatial Data Infrastructure

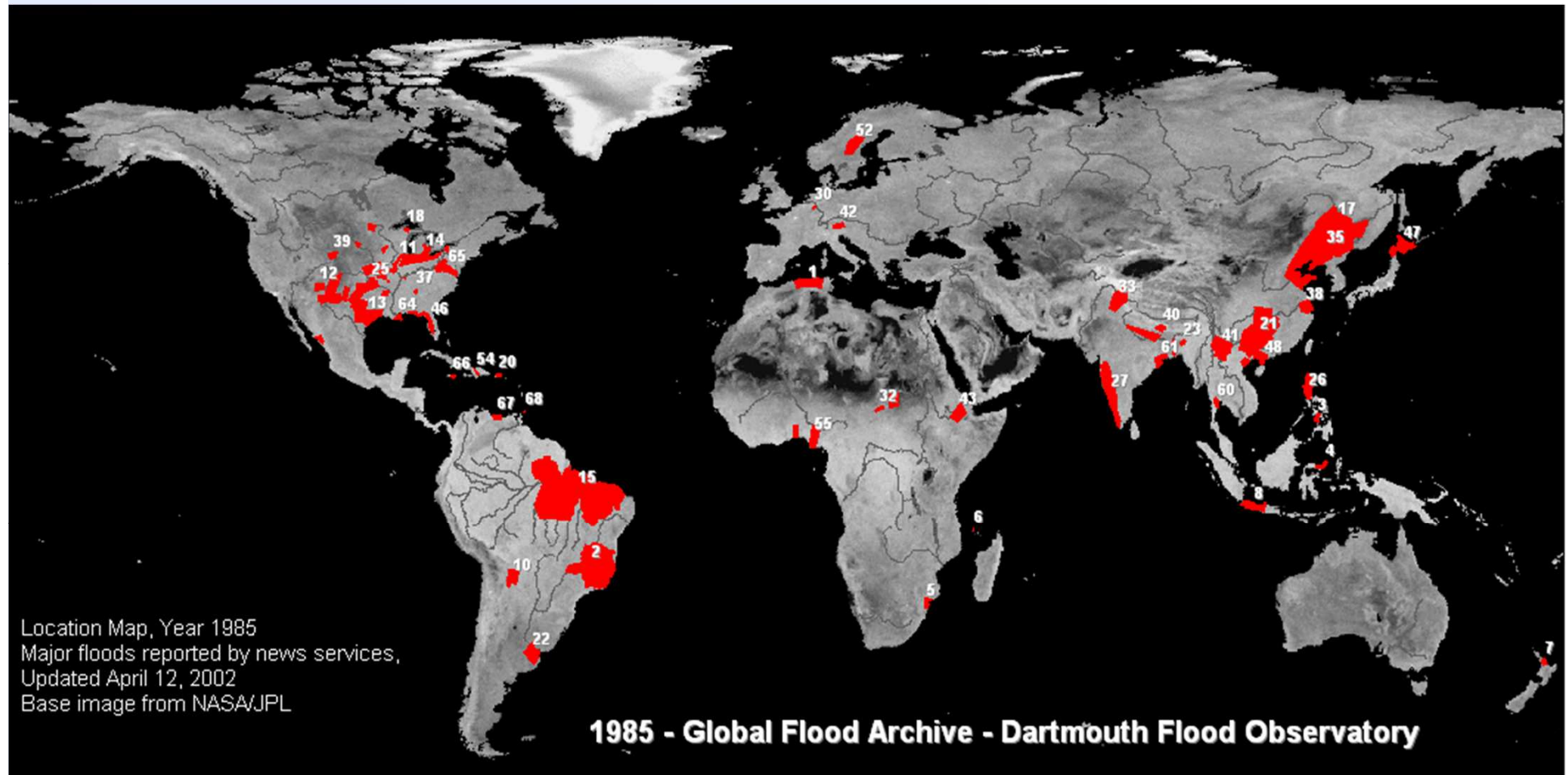
Source: [The SDI Cookbook - Global Spatial Data Infrastructure Association](#)

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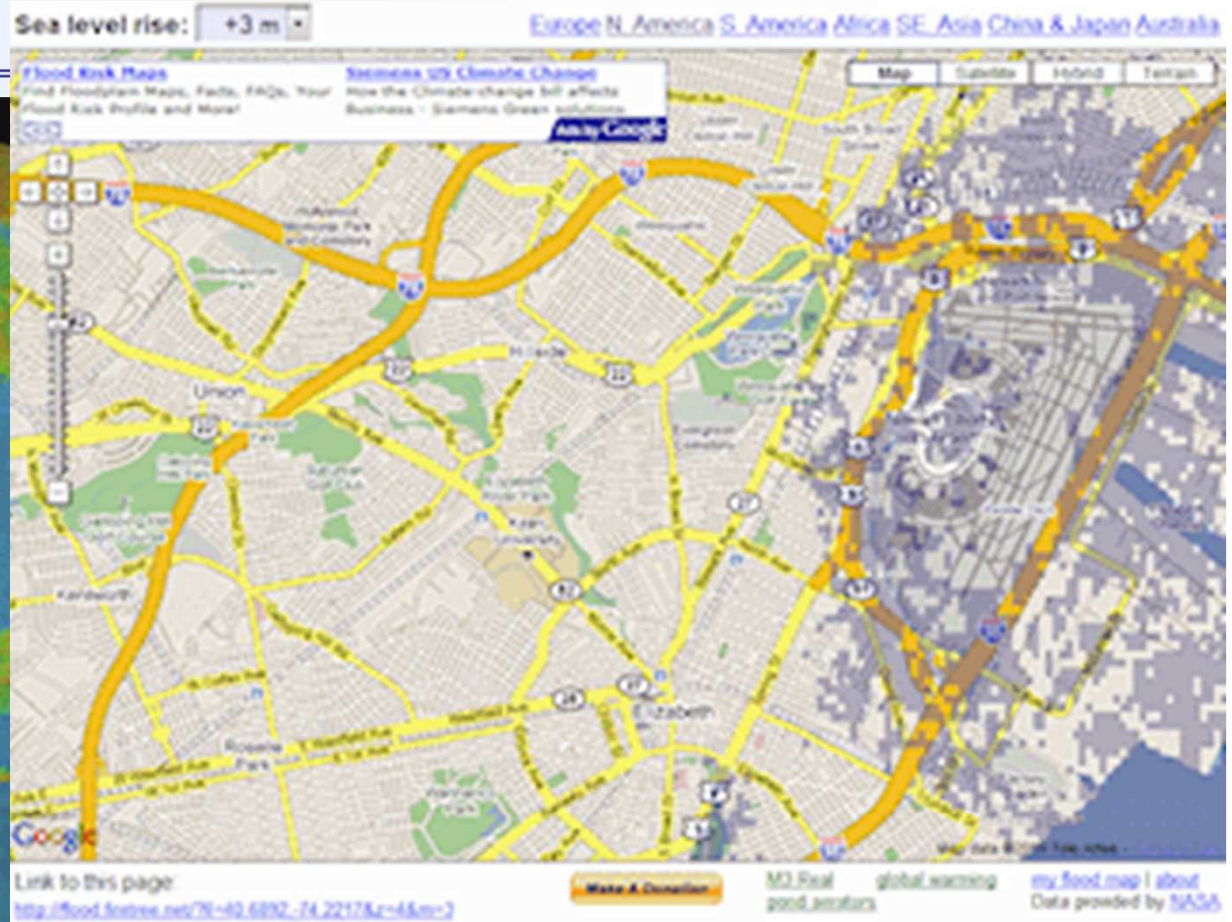
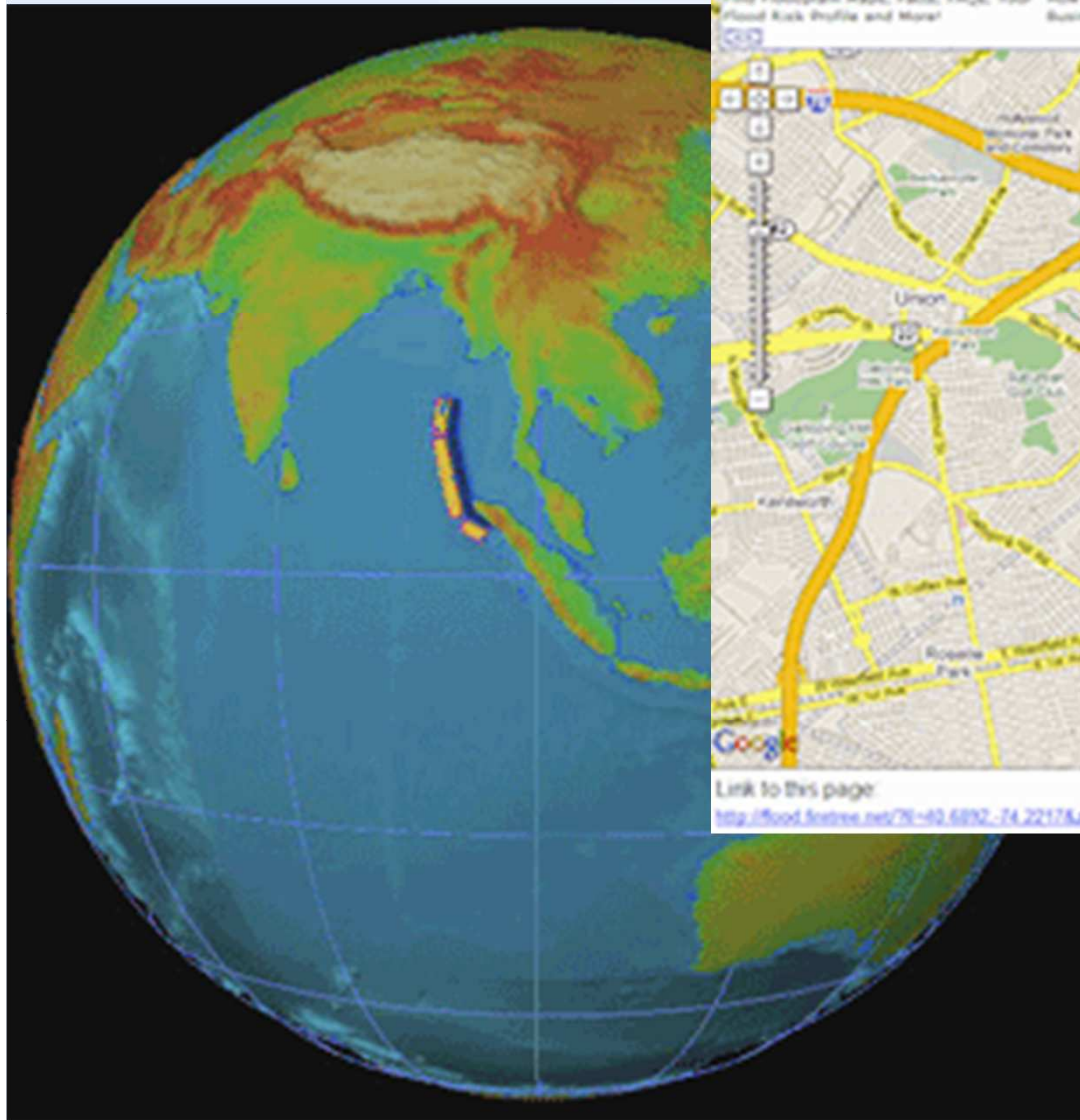
*‘The term “Spatial Data Infrastructure” (SDI) is often used to denote the relevant base collection of technologies, policies and institutional arrangements that facilitate the availability of and access to spatial data.’*

*‘The SDI provides a basis for spatial data discovery, evaluation, and application for users and providers within all levels of government, the commercial sector, the non-profit sector, academia and by citizens in general.’*

# Huge floodings in the world between 1985 and 2010



# Tsunami 2004



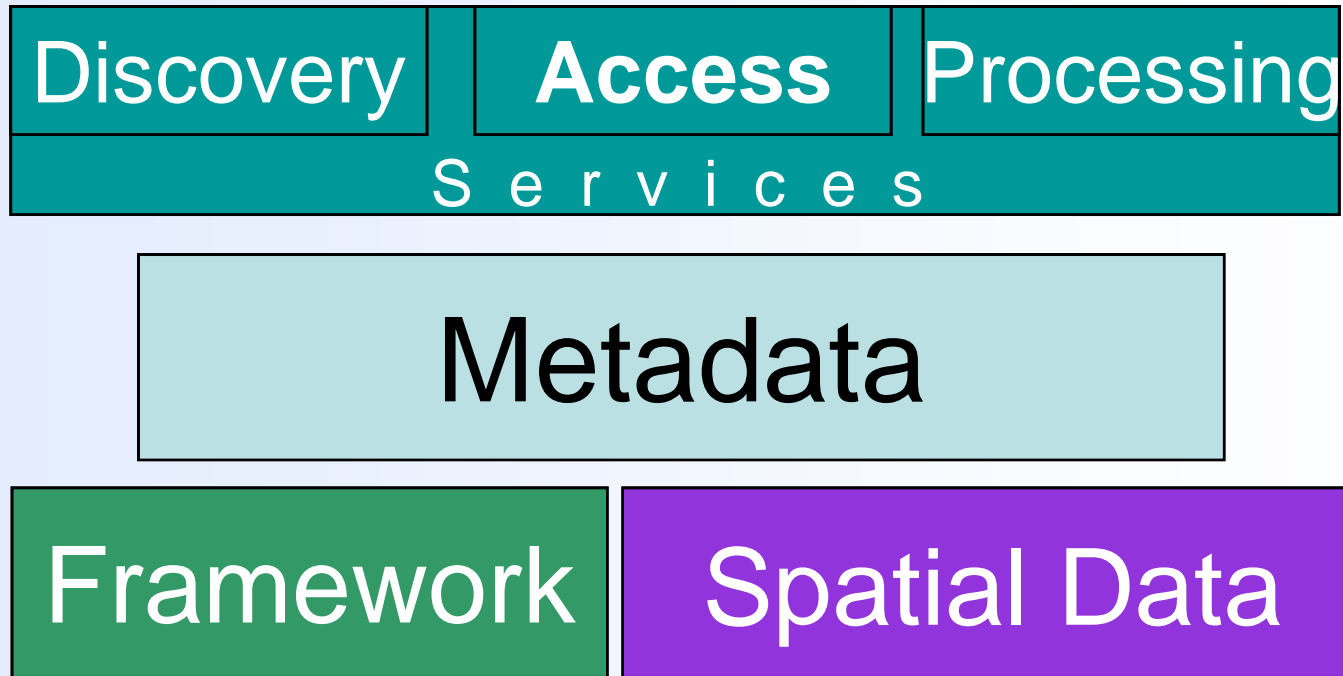
# SDI – why ?



### Box 3: The need for SDI

There has been significant rain falling for some days, and there is no indication of the rain abating in the near future. Flooding is a distinct possibility to be faced. It would be good to know what the risk of flooding is, and where people are living who should be evacuated, and what routes could be used to reach these people and transport them away from the area of danger. This implies the need for several kinds of information: where the river courses are, the elevation of the area near the rivers, where people live, and where there are roads. Does this data exist, and if so, would the data “owners” be prepared to provide this information to develop a disaster mitigation plan? Unless there is a central point to which one can go to find out what information is available, merely finding this out will take quite some effort and time. Next, assuming that somehow it is discovered that there are relevant datasets available, one needs to obtain the information from disparate sources, then integrate and process the information. In the course of this, one might discover that position of the road network depicted and the river courses clearly do not “fit” the real picture. More investigation, taking more time again, is called for, to discover how the co-ordinate systems used to reference these data differ, so that they can be aligned....

# Components of an SDI



# Classification of SDI hierarchy levels

Source: Rajabifard et al (1999)

- Global Spatial Data Infrastructure (GSDI)
- Regional Spatial Data Infrastructure (RSDI)

Ex. INSPIRE

- National Spatial Data Infrastructure (NSDI)

Ex. SDI Germany

- State or Provincial Spatial Data Infrastructure (SSDI)
- Local Spatial Data Infrastructure (LSDI)

Ex. SDI German State of Rheinland-Pfalz

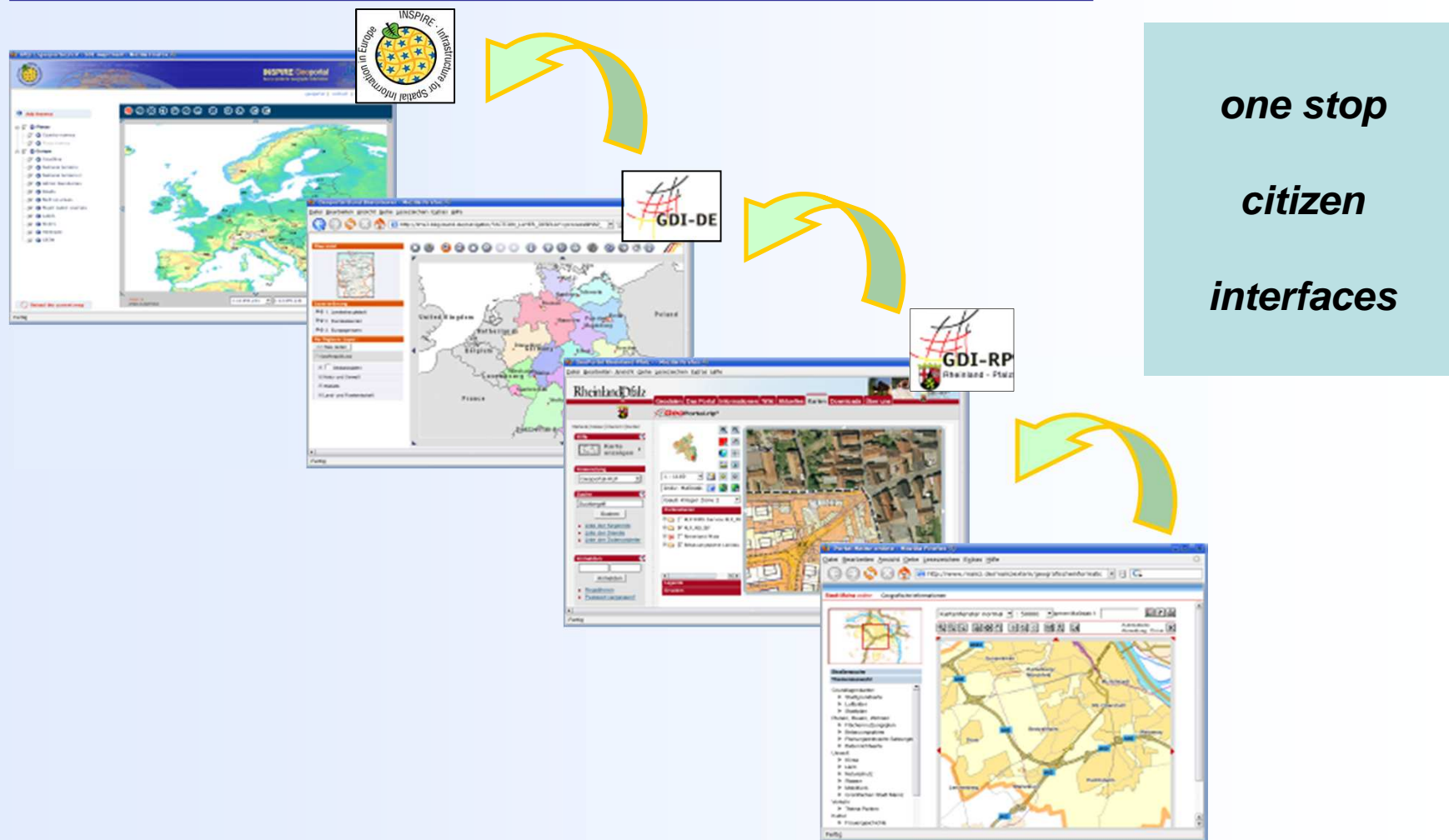
- Corporate Spatial Data Infrastructure (CSDI)

**Spatial  
Information  
Infrastructures**

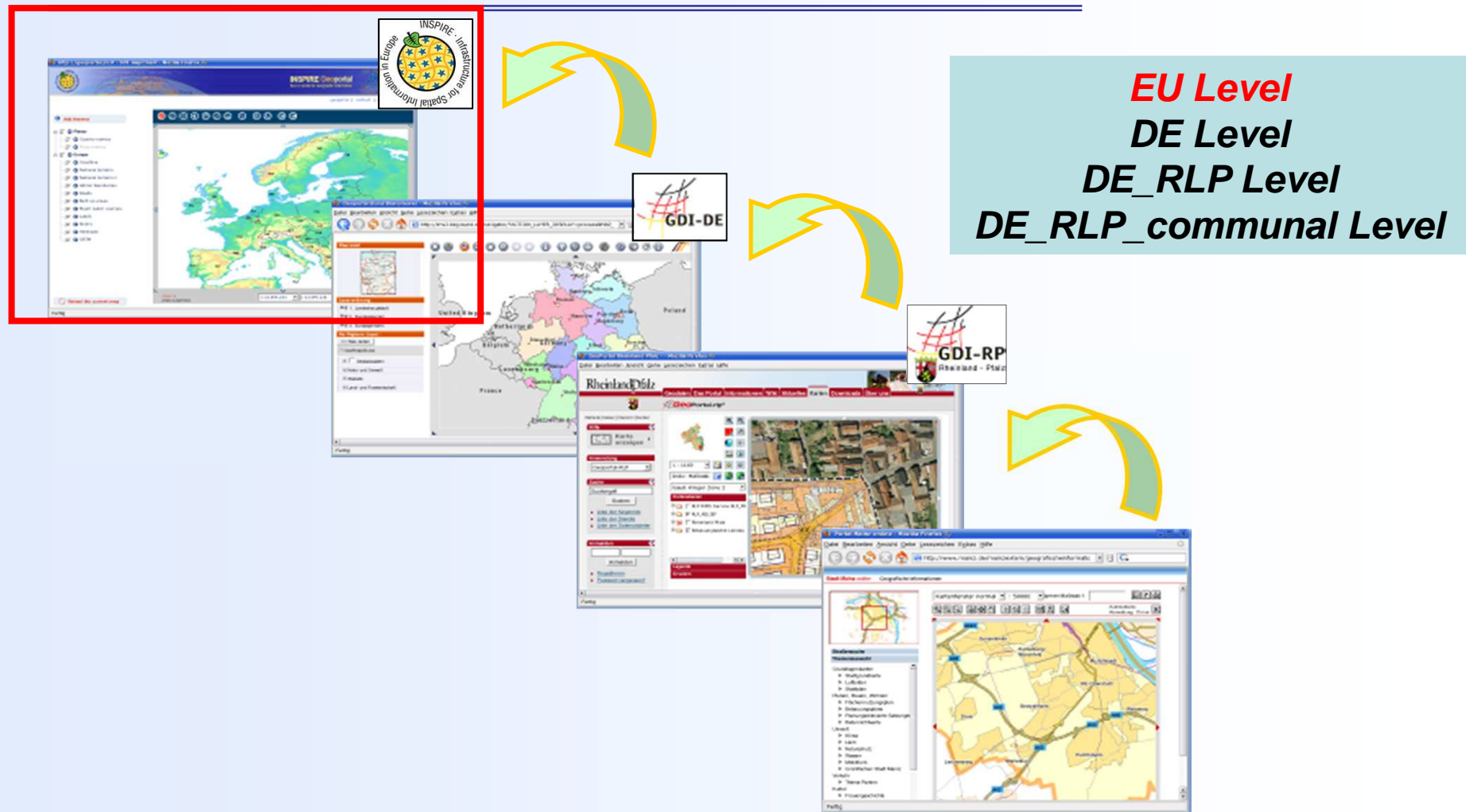
## Sub-National SDI



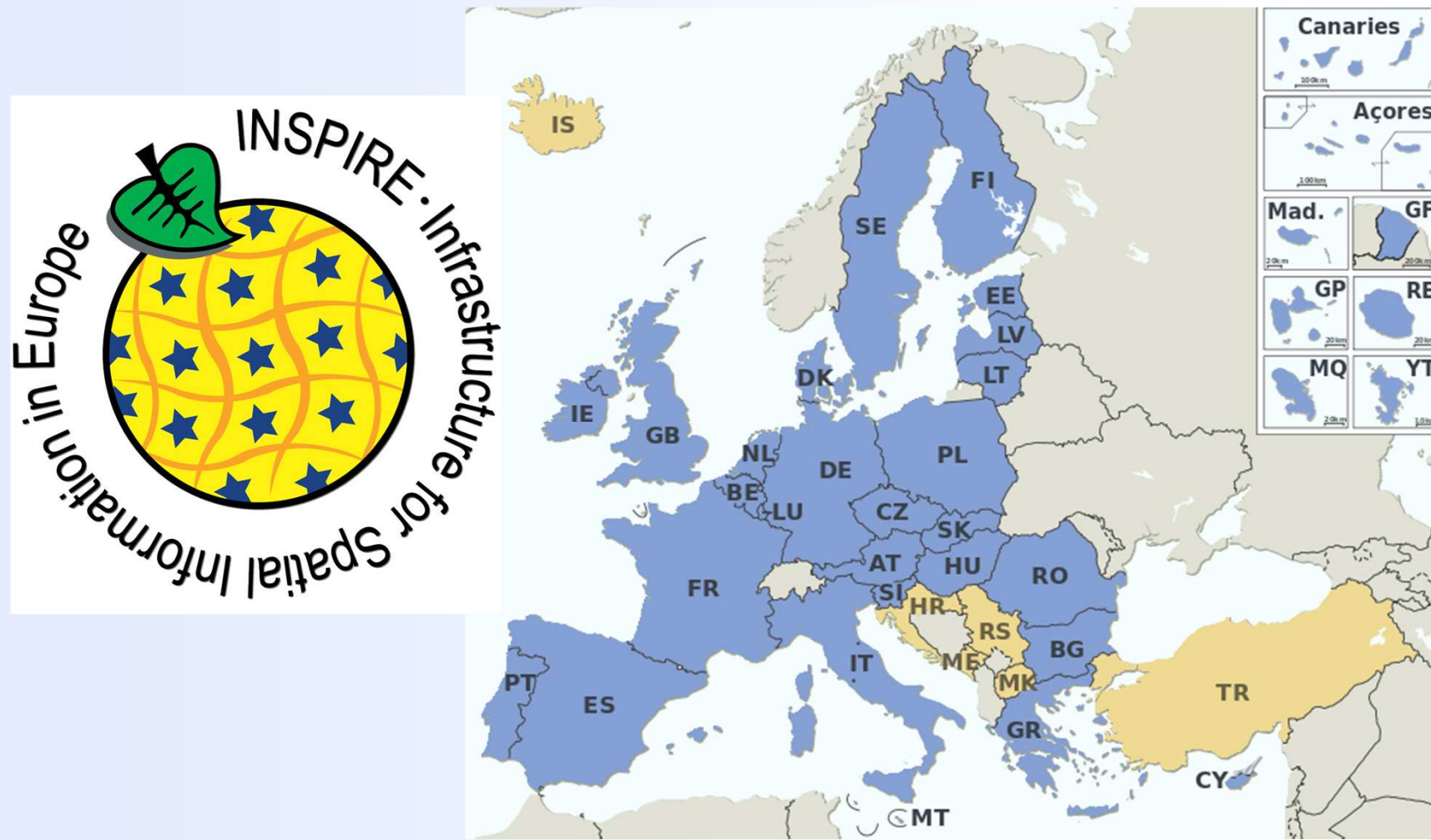
# Cascading Services linking EU Regional level, National level and Local level SDI's



# Cascading Services linking EU Regional level, National level and Local level SDI's



# Regional Spatial Data Infrastructure (RSDI)



# INSPIRE – Infrastructure for Spatial Information in Europe

## EU INSPIRE Directive

1. came into force on 15 May 2007
2. full implementation required by 2019
3. aims to create a European Union (EU) spatial data infrastructure → sharing of environmental spatial information among public sector organisations and better facilitate public access to spatial information across Europe



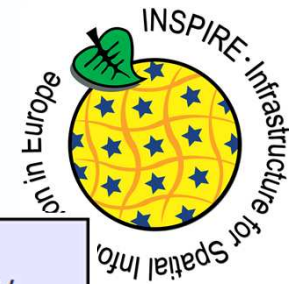
# INSPIRE Principles

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1. Data should be collected only once and kept where it can be maintained most effectively.
2. It should be possible to combine seamless spatial information from different sources across Europe and share it with many users and applications.
3. It should be possible for information collected at one level/scale to be shared with all levels/scales; detailed for thorough investigations, general for strategic purposes.
4. Geographic information needed for good governance at all levels should be readily and transparently available.
5. Easy to find what geographic information is available, how it can be used to meet a particular need, and under which conditions it can be acquired and used.

# INSPIRE Themes



<p><b>Annex I</b></p> <ol style="list-style-type: none"> <li>1. Coordinate reference systems</li> <li>2. Geographical grid systems</li> <li>3. Geographical names</li> <li>4. Administrative units</li> <li>5. Addresses</li> <li>6. Cadastral parcels</li> <li>7. Transport networks</li> <li>8. Hydrography</li> <li>9. Protected sites</li> </ol>	<p><b>Annex III</b></p> <ol style="list-style-type: none"> <li>1. Statistical units</li> <li>2. Buildings</li> <li>3. Soil</li> <li>4. Land use</li> <li>5. Human health and safety</li> <li>6. Utility and governmental services</li> <li>7. Environmental monitoring facilities</li> <li>8. Production and industrial facilities</li> <li>9. Agricultural and aquaculture facilities</li> <li>10. Population distribution – demography</li> </ol>	<ol style="list-style-type: none"> <li>11. Area management/ restriction/regulation zones &amp; reporting units</li> <li>12. Natural risk zones</li> <li>13. Atmospheric conditions</li> <li>14. Meteorological geographical features</li> <li>15. Oceanographic geographical features</li> <li>16. Sea regions</li> <li>17. Bio-geographical regions</li> <li>18. Habitats and biotopes</li> <li>19. Species distribution</li> <li>20. Energy Resources</li> <li>21. Mineral resources</li> </ol>
<p><b>Annex II</b></p> <ol style="list-style-type: none"> <li>1. Elevation</li> <li>2. Land cover</li> <li>3. Ortho-imagery</li> <li>4. Geology</li> </ol>		

# INSPIRE Geoportal, accessed 24 Nov 2012



**Discovery / Viewer**

Search, discover and access geographic information provided by European governmental, commercial, and non-commercial organizations.

[More ...](#)

**Validator**

The purpose of the INSPIRE Metadata Validator is to test the compliancy of INSPIRE metadata with the INSPIRE Metadata Regulation.

[More ...](#)

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(2.2.5) Uniqu
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**Metadata Editor**

Create metadata according to the INSPIRE implementing rules.

[More ...](#)

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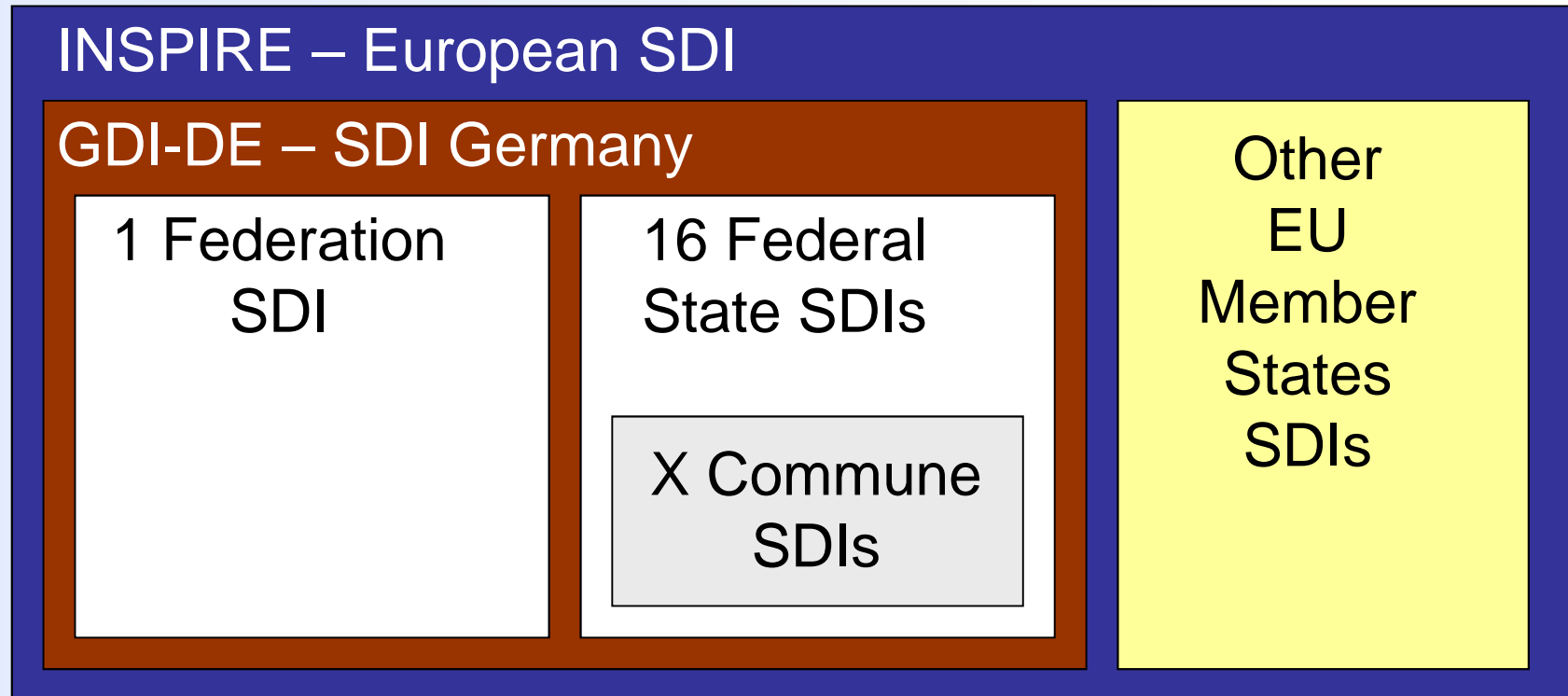
# Cascading Services linking EU Regional level, National level and Local level SDI's





# SDI Germany within the European SDI framework

Source: adapted from Schilcher et al. (2009)

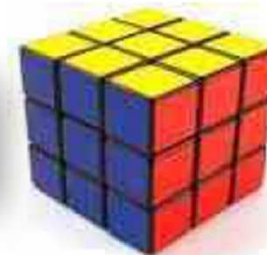
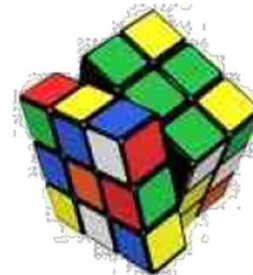
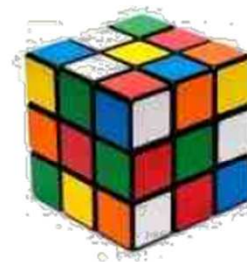


# National Spatial Data Infrastructure (NSDI)



Source: Daniela Hogrebe, Andres von Dömming, Coordination Office SDI Germany

### 3 Administrative Levels: 13.000 Municipalities, 16 States and 1 Federation



# SDI Legislation in Germany

Source: BDVI, Germany

	Geodatenzugangsgesetz	Inkrafttreten	Quelle	Link
EU	RICHTLINIE 2007/2/EG vom 14. März 2007 zur Schaffung einer Geodateninfrastruktur in der Europäischen Gemeinschaft (INSPIRE)	15.05.2007	Amtsblatt der Europäischen Union L 108/1 vom 25.04.2007	<a href="http://eur-lex.europa.eu/">http://eur-lex.europa.eu/</a>
Bund	Geodatenzugangsgesetz (GeoZG) vom 10.02.2009	14.02.2009	BGBl I Nr. 8 S. 278 vom 13.02.2009	<a href="http://bundesrecht.juris.de/geozg/">http://bundesrecht.juris.de/geozg/</a>
Baden-Württemberg	Landesgeodatenzugangsgesetz (LGeoZG) vom 17.12.2009	24.12.2009	GBl. 2009, 802	<a href="http://www.landesrecht-bw.de">http://www.landesrecht-bw.de</a>
Bayern	Bayerisches Geodateninfrastrukturgesetz (BayGDIG) vom 22.07.2008	01.08.2008	GVBl 2008, S. 453 vom 22.07.2008	<a href="http://by.juris.de/by/gesamt/GDIG_BY.htm">http://by.juris.de/by/gesamt/GDIG_BY.htm</a>
Berlin	Geodatenzugangsgesetz Berlin (GeoZG Bln) vom 03.12.2009	13.12.2009	GVBl. vom 12.12.2009 S. 682	<a href="http://www.stadtentwicklung.berlin.de/geoinformation/geodateninfrastruktur/download/GeoZG_Bln.pdf">http://www.stadtentwicklung.berlin.de/geoinformation/geodateninfrastruktur/download/GeoZG_Bln.pdf</a>
Brandenburg	Brandenburgisches Geodateninfrastrukturgesetz (BbgGDIG) vom 13.04.2010	14.04.2010	GVBl. I - 2010, Nr. 17	<a href="http://www.bravors.brandenburg.de">http://www.bravors.brandenburg.de</a>
Bremen	Bremisches Geodatenzugangsgesetz (BremGeoZG) vom 24.11.2009	10.12.2009	Brem. GBl. 65/2009 S. 531	<a href="http://www.gdi-sh.de/GeoZG-Bremen.pdf">http://www.gdi-sh.de/GeoZG-Bremen.pdf</a>
Hamburg	Hamburgisches Geodateninfrastrukturgesetz (HmbGDIG) vom 15.12.2009	31.12.2009 (?)	HmbGVBl. Nr. 57/2009 S. 528 vom 30.12.2009	<a href="http://www.luewu.de/gvbl/2009/57.pdf">http://www.luewu.de/gvbl/2009/57.pdf</a>
Hessen	Gesetz zur Änderung des Hessischen Vermessungs- und Geoinformationsgesetzes und des Denkmalschutzgesetzes v. 4.3.2010	17.03.2010	GVBl. I 2007, 548 v. 16.03.2010	<a href="http://www.rv.hessenrecht.hessen.de/">http://www.rv.hessenrecht.hessen.de/</a>
Mecklenburg-Vorpommern	Geoinformations- und Vermessungsgesetz (GeoVermG M-V) vom 16.12.2010	30.12.2010	GVObI. M-V 2010, S. 713	<a href="http://www.landesrecht-mv.de/jportal/">http://www.landesrecht-mv.de/jportal/</a>
Niedersachsen	Niedersächsisches Geodateninfrastrukturgesetz (NGDIG) vom 17.12.2010	29.12.2010	Nds. GVBl. 2010, 624	<a href="http://www.nds-voris.de/jportal/">http://www.nds-voris.de/jportal/</a>
NRW	Geodatenzugangsgesetz (GeoZG NRW) vom 17.02.2009	18.02.2009	GV. NRW. 5/2009 S. 84	<a href="https://recht.nrw.de/">https://recht.nrw.de/</a>
Rheinland-Pfalz	Landesgeodateninfrastrukturgesetz (LGDIG) vom 23.12.2010	31.12.2010	GVBl 2010, S. 548	<a href="http://rlp.juris.de/rlp/gesamt/GDIG_RP.htm">http://rlp.juris.de/rlp/gesamt/GDIG_RP.htm</a>
Saarland	Saarländisches Geodateninfrastrukturgesetz (SGDIG) vom 01.07.2009	28.08.2009 (befristet bis 31.12.2015)	Amtsbl. d. Saarl. vom 27.08.2009 S. 1426	<a href="http://sl.juris.de">http://sl.juris.de</a>
Sachsen	Gesetz über die Geodateninfrastruktur im Freistaat Sachsen (SächsGDIG) v. 19.05.2010	05.06.2010	SächsGVBl. Nr. 6/2010 S. 134 v. 04.06.2010	<a href="http://www.gdi-de.org/download/inspire_gesetze/SaechsGDIG.pdf">http://www.gdi-de.org/download/inspire_gesetze/SaechsGDIG.pdf</a>
Sachsen-Anhalt	Geodateninfrastrukturgesetz für das Land Sachsen-Anhalt (GDIG LSA) vom 14.07.2009	21.07.2009	GVBl. LSA 13/2009, S. 368 vom 20.07.2009	<a href="http://www.landesrecht.sachsen-anhalt.de">http://www.landesrecht.sachsen-anhalt.de</a>
Schleswig-Holstein	Geodateninfrastrukturgesetz für das Land Schleswig-Holstein (GDIG) vom 15.12.2010	24.12.2010	GVObI. 2010, 717	<a href="http://www.gesetze-rechtsprechung.sh.juris.de/">http://www.gesetze-rechtsprechung.sh.juris.de/</a>
Thüringen	Thüringer Geodateninfrastrukturgesetz (ThürGDIG) vom 08.07.2009	31.07.2009	GVBl 10/2009 S.574	<a href="http://landesrecht.thueringen.de/">http://landesrecht.thueringen.de/</a>

# Geoportal Bund, Protected area information

Source: <http://ims1.bkg.bund.de/navmpsg/basicviewer.jsp>

The screenshot displays the Geoportal Bund web application interface. On the left, there is an 'Overview map' showing Europe with Germany highlighted. Below it, the 'Layer order' section includes buttons for '>> Legend' and '>> Copyright', and a list of layers: '1. Wasserschutzgebiet', '2. Bundeslaender', and '3. Europagrenzen'. The 'Available layers' section lists: 'Modellprojekt Schutzgebiete', 'MP Schutzgebiete', 'Geobasisdaten', 'Gewaesser', and 'Topograph. Karte Deutschland'. An 'Important Information !!!' warning icon is also present.

The main map view shows Germany with various colored protected areas. A coordinate system dropdown menu is open, showing options: 'UTM Zone 32N, ETRS 89' (selected), 'Gauss-Krueger 2,DHDN', 'Gauss-Krueger 3,DHDN', 'Gauss-Krueger 4,DHDN', 'Gauss-Krueger 5,DHDN', 'UTM Zone 32N, WGS 84', 'UTM Zone 33N, WGS 84', 'UTM Zone 32N, ETRS 89', 'UTM Zone 33N, ETRS 89', and 'WGS 84, geogr.'. The map includes labels for neighboring countries: United Kingdom, Netherlands, Belgium, Luxembourg, France, Poland, Czech Republic, Austria, Slovakia, and Hungary. A scale bar indicates 150km. The coordinate system is identified as UTM Zone 32N, ETRS89.

# Geoportal Bund, Protected area information

zoomed view to the Rhein-Main area around Frankfurt

Source: <http://ims1.bkg.bund.de/navmpsg/basicviewer.jsp>

**Overview map**

**Layer order**

>> Legend >> Copyright

- 1. Wasserschutzgebiet
- 2. Fluesse
- 3. Landeshauptstadt
- 4. bis 25000 Einwohner
- 5. Europagrenzen

**Available layers:**

- Modellprojekt Schutzgebiete**
  - MP Schutzgebiete
    - Fauna-Flora-Habitat-Gebiet
    - Biosphaerenreservat
    - Landschaftsschutzgebiet
    - Naturschutzgebiet
    - Naturpark
    - Nationalpark
    - Wasserschutzgebiet
    - Vogelschutzgebiet
  - Geobasisdaten
  - DLM50 D-Online
  - Ortschaften

© GeoPortal.Bund - Pilot Project Protected Areas 01.09.2010

min/max coordinates (x/y) 398935m; 5505943m and 494185m; 5566797m  
 Coordinate system: UTM Zone 32N, ETRS89

# Cascading Services linking EU Regional level, National level and Local level SDI's



# Sub-National SDI's

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*Sub-National SDI is a very heterogeneous field*

Rural areas  $\leftrightarrow$  Urban areas

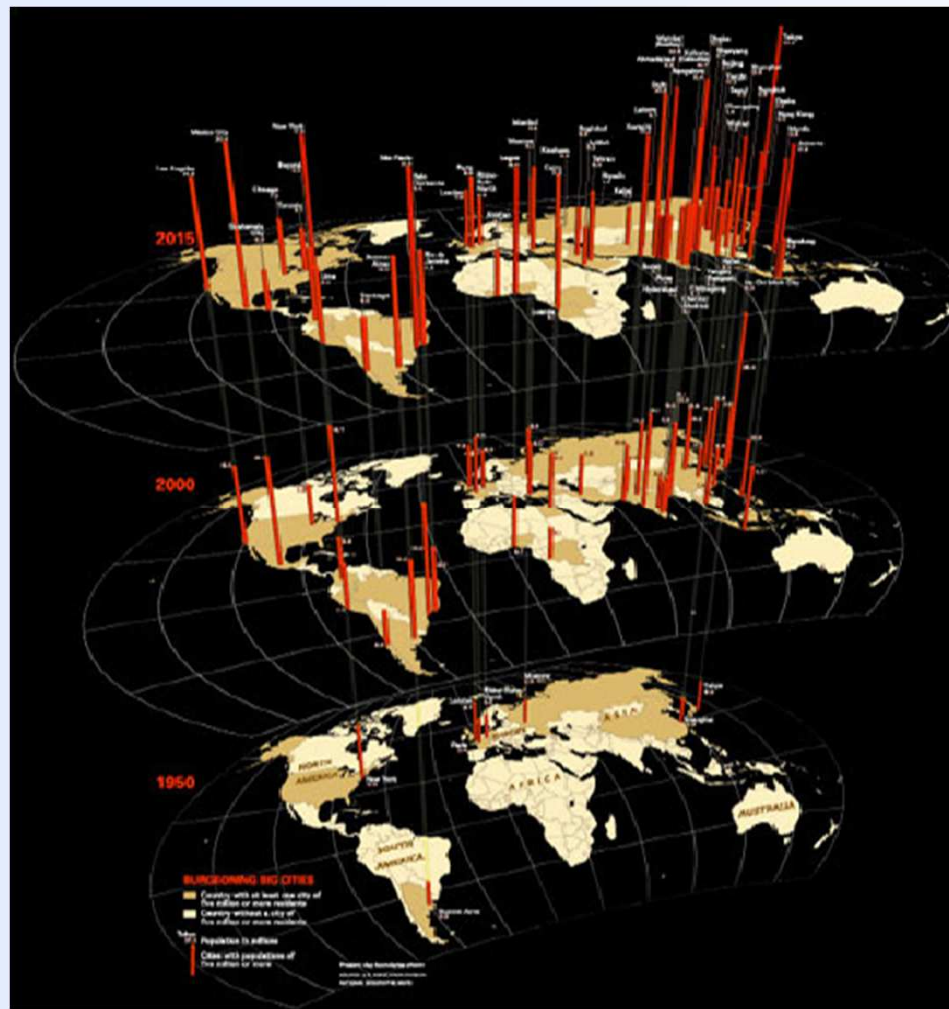
Small administration units  $\leftrightarrow$  large administration units

Non-established basic ICT Infrastructure  $\leftrightarrow$  well established basic ICT infrastructure

.....



# Megacities: home to 10 million or more



- 2015 Latin America, Central Africa, Asia
- 2005 Latin America, India, North America, Asia
- 1950s New York, Tokyo, Buenos Aires, European Capitals

# Problems to be managed within Large Cities

- Transport, Traffic congestion
- Energy inadequacy
- Informal development, lack of services
- Insecurity, crime
- Water, soil, air pollution
- Poor natural hazards management
- Climate change



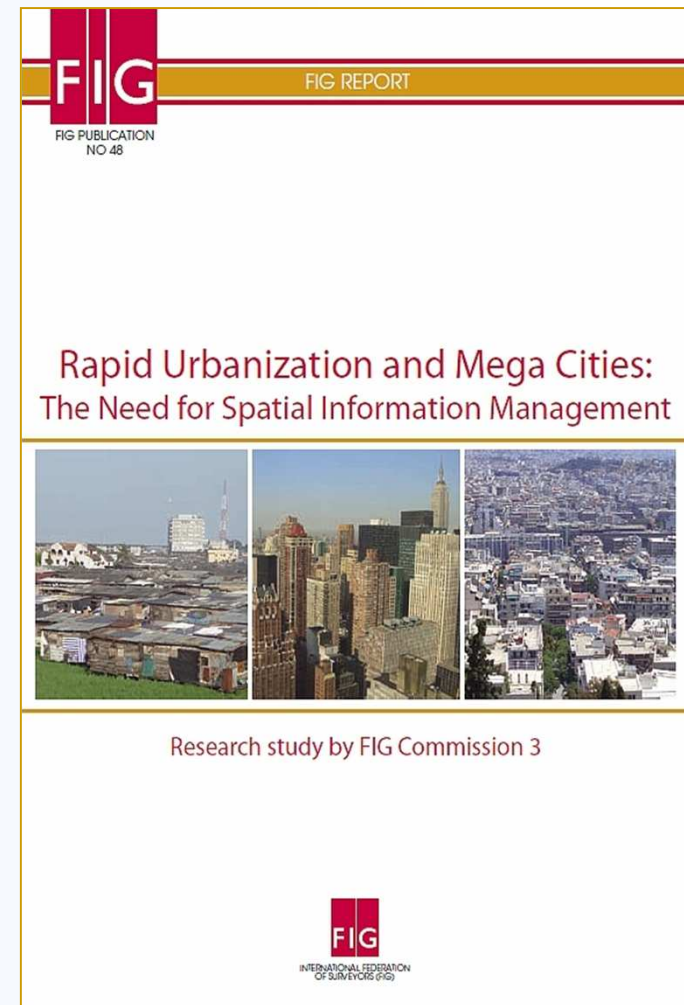
## Place matters - all have a spatial dimension

- **Food, water and energy insecurity**
- **Informal development, high urban densities, dilapidated city centers**
- **Lack of green areas and of buildings reflecting local cultural heritage,**
- **Transportation problems, traffic congestion and accidents**
- **Lack of basic services, insecurity of tenure, informal real estate markets**
- **Unsustainable land use and inefficient land administration systems**
- **Creation of slums, criminality**
- **Difficulty in natural hazards management**
- **Water, soil and air pollution, climate change**
- **Weak institutions to resolve conflict**
- **Inefficient administration, bad governance**

# FIG publication 48: Rapid Urbanization and Mega Cities

As cities get larger spatial information is becoming a key resource in efficient delivery of e-government services, public safety, national security and asset management.

In this FIG research study, it is proposed that a city-wide spatial data infrastructure linked to similar structures in other levels of government, can provide a sustainable solution to many problems of mega cities.



# Spatial Information – how can it be used? (1)

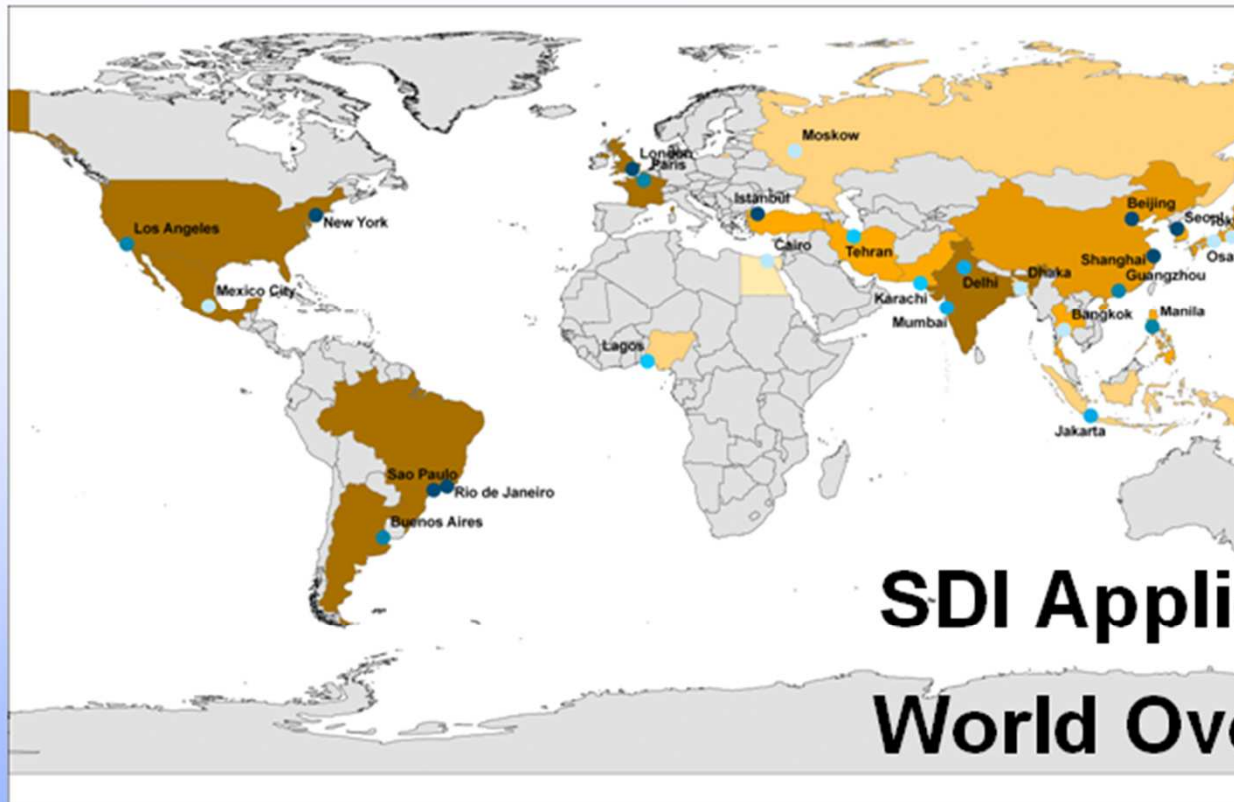
<i>Issue</i>	<i>Use of spatial information</i>	<i>Examples</i>
<b><i>Environmental</i></b>		
Land use planning	Describe spatial extent of allowable land uses	Land zoning maps
Impact of development	Describe land capability and sustainability	Terrain maps showing vulnerability to land slippage
Impact of climate change	Vulnerability to rising sea level and tidal surges	Flood prone land mapping and real-time weather mapping
Access to water	Location of dams and fresh and waste water reticulation networks	Catchment terrain maps
Pollution and hazards	Location of broad and point specific pollution and hazardous wastes	Inventory of properties where hazardous wastes are stored

# Spatial Information – how can it be used? (2)

<i>Issue</i>	<i>Use of spatial information</i>	<i>Examples</i>
<b>Governance</b>		
Land allocation	Describe pattern of current land use	Digital cadastral database
Access to serviced land	Current location of serviced land	Cadastral map overlaid by current aerial photography and utility service networks
Secure property rights	Spatial extent of existing property rights	Land titles register containing all rights, restrictions and obligations for each property
Community participation	Public access to cadastral, planning and environmental information affecting individuals and the community	Public display of proposed developments, land suitability and other maps
Fiscal sustainability	Comprehensive and accurate records of the extent of existing property rights and land use	Land valuations shown on cadastral maps
Public safety	Comprehensive data about roads, properties and hazards	Emergency dispatch system; bushfire models
Slum reduction	Location of vacant or under-utilised land and population growth predictions	Current aerial photography, predictive modeling of land use
Measuring performance	Land change over time	Land change mapping

## Spatial Information – how can it be used? (3)

<i>Issue</i>	<i>Use of spatial information</i>	<i>Examples</i>
<b><i>Social and economic infrastructure</i></b>		
Employment	Location of existing enterprises and land zoning for future business use based on predicted population growth	Maps showing land zoned for business use
Communal facilities	Location of land set aside for communal facilities	Street map showing location of communal facilities
Utility services	Location and attributes of fresh water, sewer, storm water, electricity and telephone networks	Cadastral maps showing utility services
Transport	Location and attributes of public roads	In car navigation device using up-to-date road network and GPS
<b><i>External effects</i></b>		
Rural sustainability	Location, size and productive capacity of rural properties	Satellite images of rural areas overlaid by cadastral boundaries
Access to raw materials	Location of sources of food and mineral production and transportation corridors for their movement to the city	Topographic mapping series



# SDI Application World Overview

Technical progress of SDI (2008)  
Home countries and related mega cities

Home Country	Mega City
SDI development status unknown	SDI development status unknown
SDI master plan available	SDI master plan available
Primary spatial data available	Primary spatial data available
Secondary spatial data available	Secondary spatial data available
Spatial data accessibility available	Spatial data accessibility available



# SDI application in the Pan American region



Technical progress of SDI (2008)  
Home countries and related mega cities

Home Country	Mega City
SDI development status unknown	SDI development status unknown
SDI master plan available	SDI master plan available
Primary spatial data available	Primary spatial data available
Secondary spatial data available	Secondary spatial data available
Spatial data accessibility available	Spatial data accessibility available

## Results

### NSDI

- In the whole Pan American region spatial data are available via distributed applications

### Mega City SDI

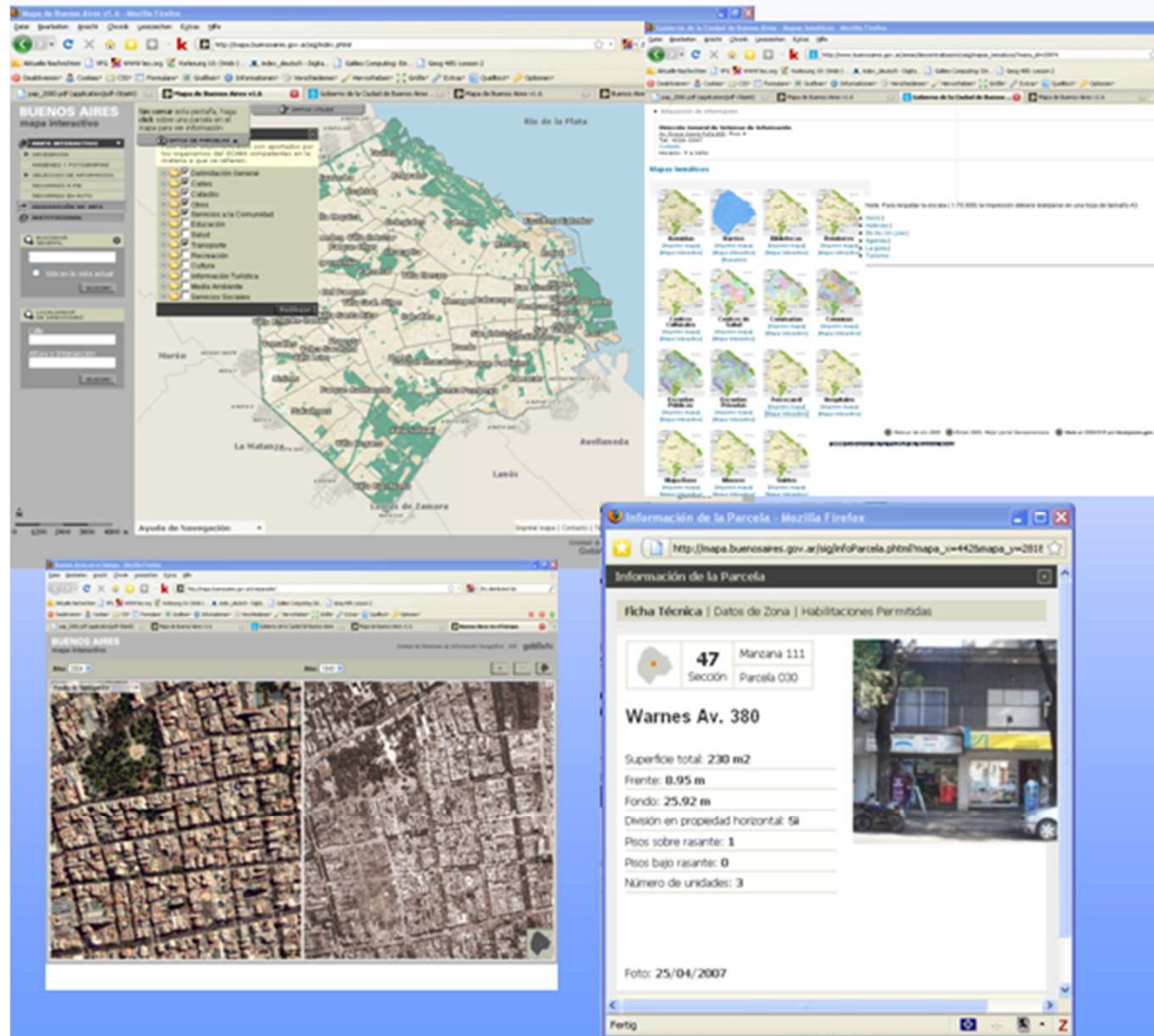
- In **Mexico City** the SDI development status is unknown
- **Los Angeles** and **Buenos Aires** provide for primary and secondary spatial data
- **Sao Paulo**, **Rio de Janeiro** and **New York City** data access via widespread WebGIS applications is available

# Example: SDI application in Buenos Aires

## Mapa Buenos Aires

- Open Source WebGIS development, which covers a range of applications like health, education, tourism, sports, culture, social services etc.
- Access to information down to parcel units
- Access on thematic maps in digital and analogue format
- Access on historical maps (a viewer enables comparison of historical orthofotos with current orthofotos)

<http://mapa.buenosaires.gov.ar/sig/index.phtml>



# Public access to parcel information of the City of Buenos Aires

The screenshot displays the 'BUENOS AIRES mapa interactivo' website. On the left, there is a navigation menu with options like 'MAPA INTERACTIVO', 'NAVEGACION', 'IMAGENES Y FOTOGRAFIAS', 'SELECCION DE INFORMACION', 'RECORRIDO A PIE', 'RECORRIDO EN AUTO', 'ADQUISICION DE INFO', and 'INSTITUCIONAL'. Below the menu is a search bar and a 'LOCALIZADOR DE DIRECCIONES' section. The main map area shows a street grid with 'Azopardo' and 'San Telmo' labeled. A tooltip above the map reads: 'Sin cerrar esta pestaña, haga click sobre una parcela en el mapa para ver información'. A 'DATOS DE PARCELAS' button is visible. On the right, a browser window titled 'Información de la Parcela - Mozilla Firefox' is open, displaying the following details:

**Información de la Parcela**

Ficha Técnica | Datos de Zona

	<b>04</b>	Manzana 058
Sección		Parcela 003

**Azopardo 858**

- Superficie total: **708 m2**
- Frente: **13.70 m**
- Fondo: **52.48 m**
- División en propiedad horizontal: **No**
- Pisos sobre rasante: **5**
- Pisos bajo rasante: **0**
- Número de unidades:

Foto: 01/04/1997

! Los datos disponibilizados por la USIG en el sitio "http://mapa.buenosaires.gov.ar", son aportados por los organismos del Gobierno de la Ciudad Autónoma de Buenos Aires competentes en la materia a que se refieren.

Fertig

Unidad de Sistemas de Información Geográfica - ASI  
Gobierno de la Ciudad de Buenos Aires

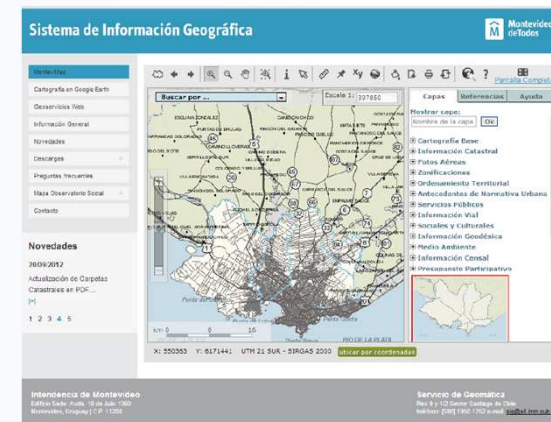
# Sub-National SDI in Uruguay

María Victoria Alvarez, Richard Camejo, Germán Iglesias and Enrique Luque

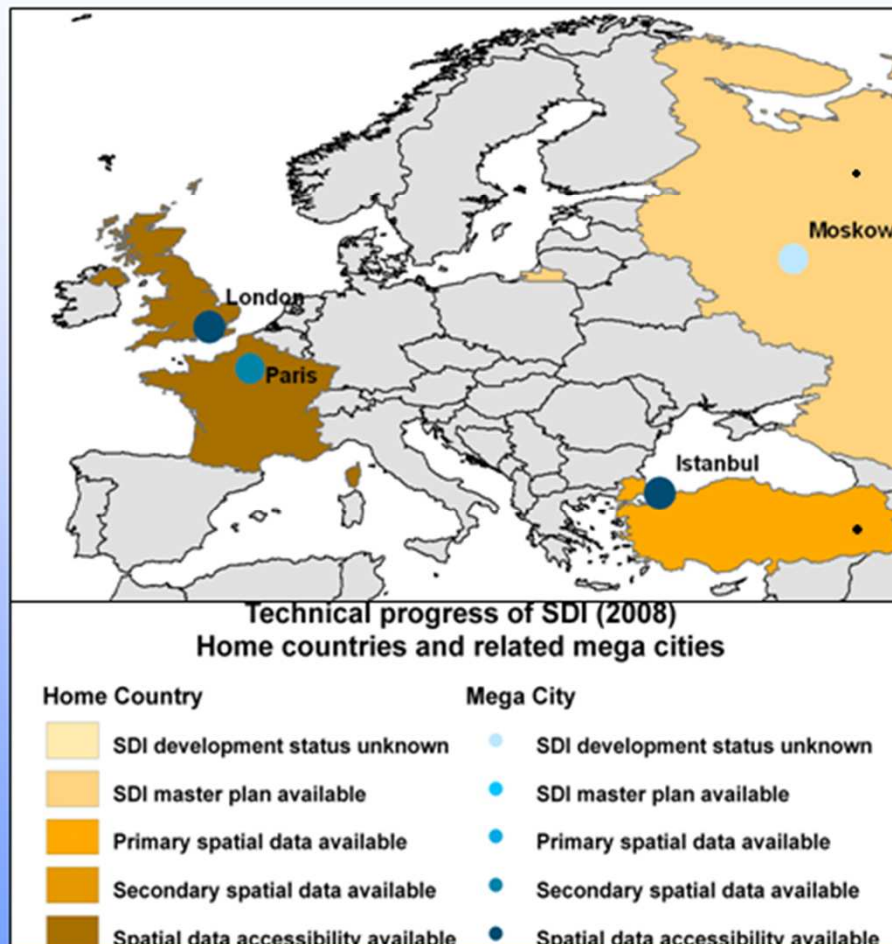
(Uruguay)

Public and Accessible Geographic Information at Montevideo City Hall

Paper to be presented on Tue, 27 Nov, TS 04C



# SDI application in the European region



## Results

### NSDI

- Development of a SDI master plan for **Russia**
- **Turkey** has produced a variety of primary spatial data
- In **France** and the **UK** spatial data are accessible via a Geoportal

### Mega City SDI

- In **Moscow** the SDI development status is unknown
- In **Paris** a WebGIS application enables the visualization of different primary and secondary data
- **London** and **Istanbul** provides for different systems with spatial data access

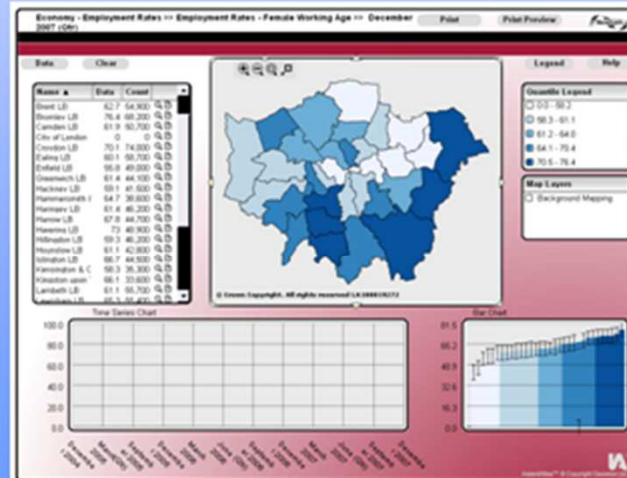
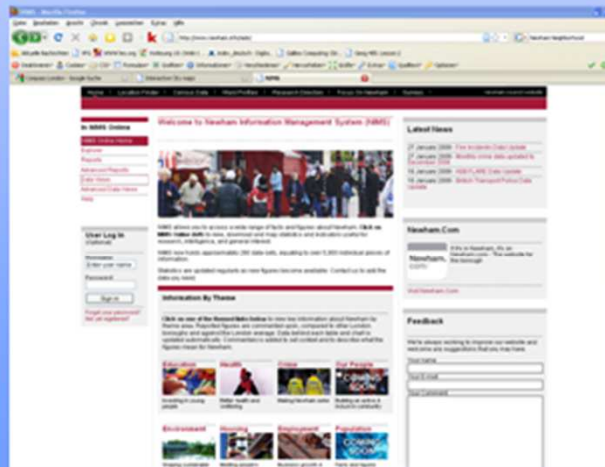
# Example: SDI applications in London



## COMPASS

- Government of London provides for online system COMPASS, access to information about the city via different layers and generation of interactive Maps
- Spatial queries like "where is our nearest service"
- Information about planning policies <http://www.cityoflondon.gov.uk/~Corporation/maps/~Interactive+City+maps.htm>

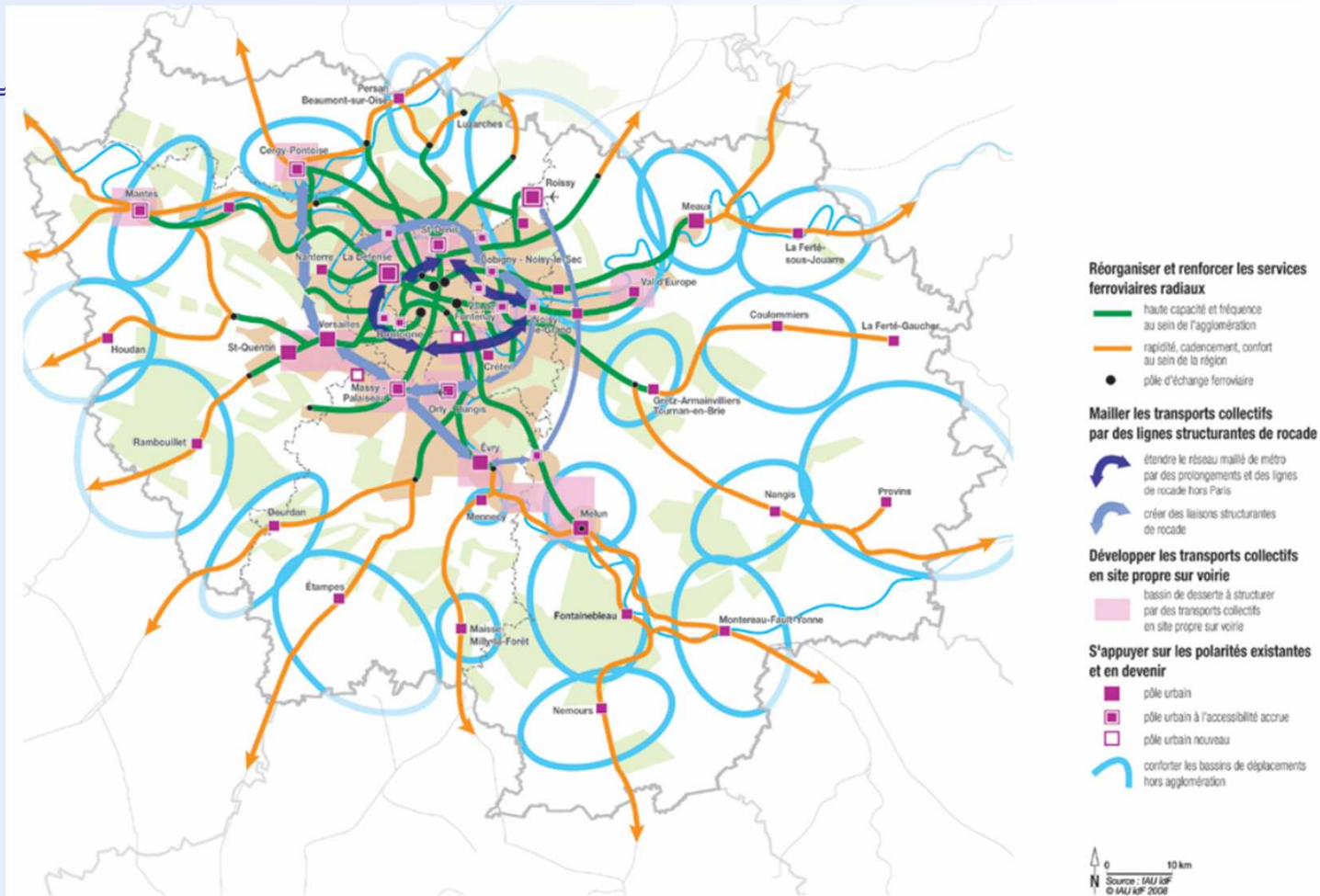
## Newham Neighbourhood Information System (NIMS)



- Access to data on economic, social and environmental conditions of the borough
- NIMS holds approximately 260 data-sets, equating to over 5,000 individual pieces of information
- Maps, charts, data download, comparison with other boroughs of London

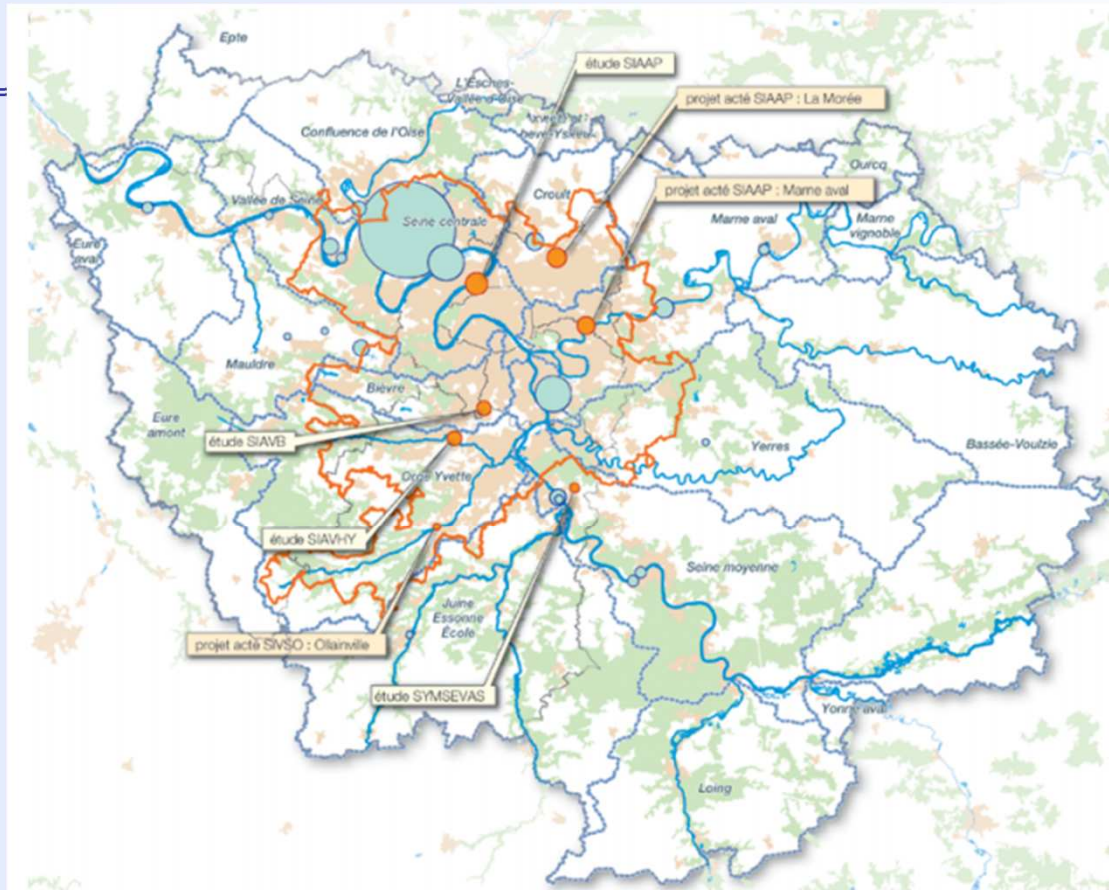
<http://www.newham.info/iads/>

# The greater Paris master plan project – Transportation



© IAU îdF 2008 - Référentiel territorial du projet de SDRIF  
 source : Schéma directeur de la région Île-de-France, projet adopté par délibération du Conseil régional le 25 septembre 2008, sous réserve de contrôle de légalité

# The greater Paris master plan project – Water sanitation



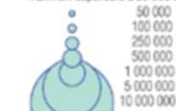
### Stations d'épuration et leur capacité en équivalent habitant

Projets de stations d'épuration actés ou à l'étude en 2008 de capacité projetée supérieure à 50 000 équivalent habitant



(échelle proportionnelle)

Stations d'épuration existantes en 2008 de capacité maximum supérieure à 50 000 équivalent habitant



(échelle proportionnelle)

□ zone de collecte du SIAAP : dans le cadre de l'assainissement de l'agglomération, une part des rejets est transférée vers les grands cours d'eau, diminuant d'autant la pression exercée en amont

— rivières principales

□ limite de bassin versant de rivière

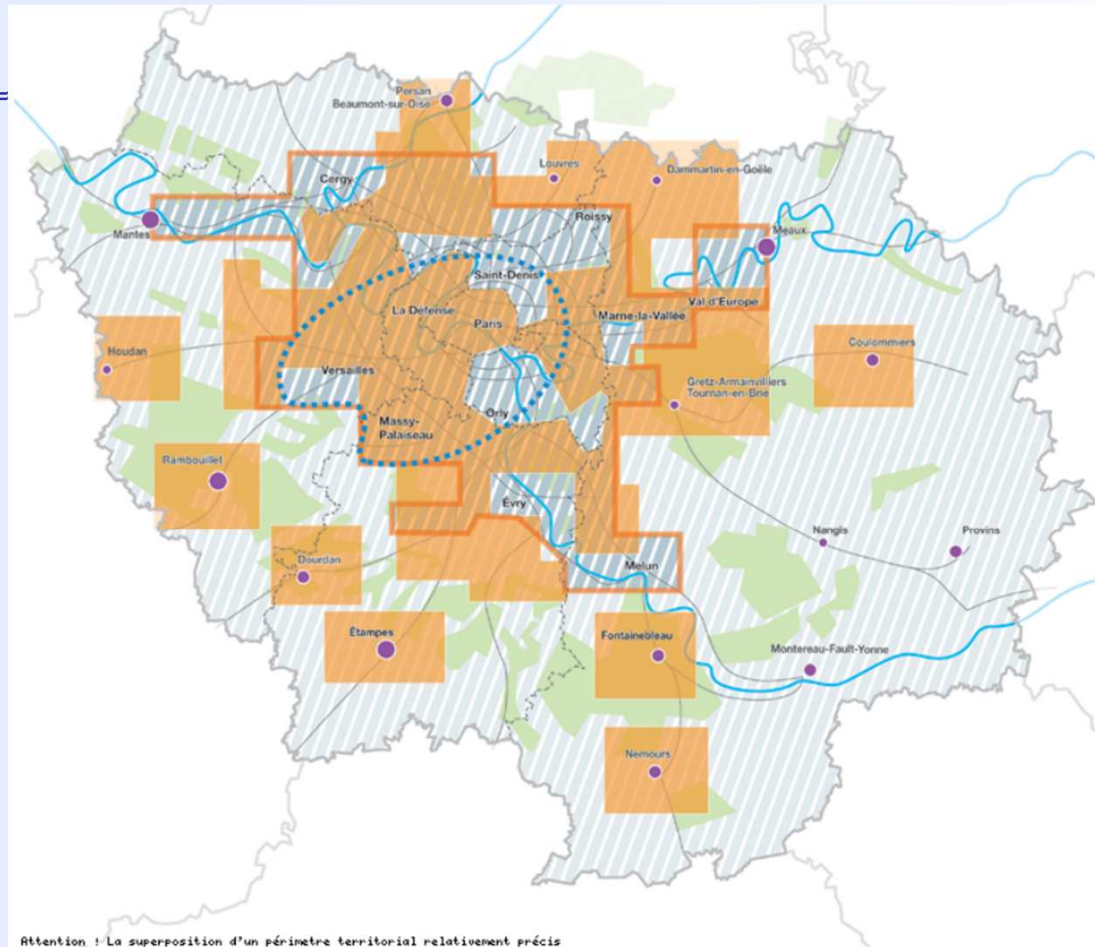


© IAU IDF 2008 - Référentiel territorial du projet de SDRIF

source : Schéma directeur de la région Île-de-France, projet adopté par délibération du Conseil régional le 25 septembre 2008, sous réserve de contrôle de légalité



# The greater Paris master plan project – Housing



**Articuler logements, desserte et qualité urbaine**

- secteur d'implantation privilégié du logement
- secteur d'implantation de logements en réponse aux besoins locaux
- en confortant les pôles

**Recréer les conditions de la mobilité résidentielle**

- réduire un déficit global en logement social
- diversifier le parc

**Accompagner la dynamique de bureaux par la construction de logements**

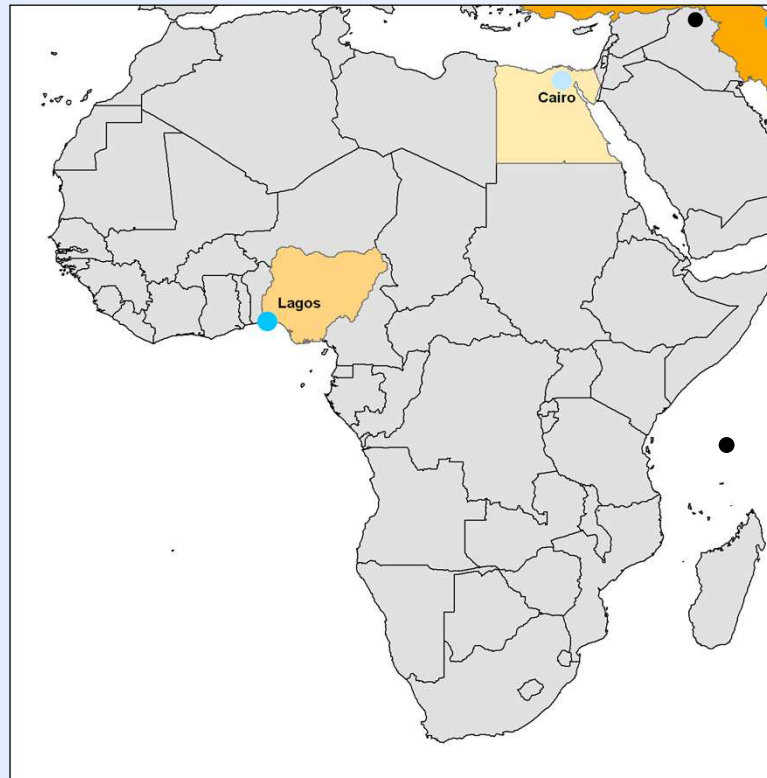
- construction de bureaux conditionnée à celle des logements

0 10 km  
N  
Source : IAU îdF  
© IAU îdF 2008

Attention : La superposition d'un périmètre territorial relativement précis a une carte relativement schématisée est susceptible d'en gêner l'interprétation.

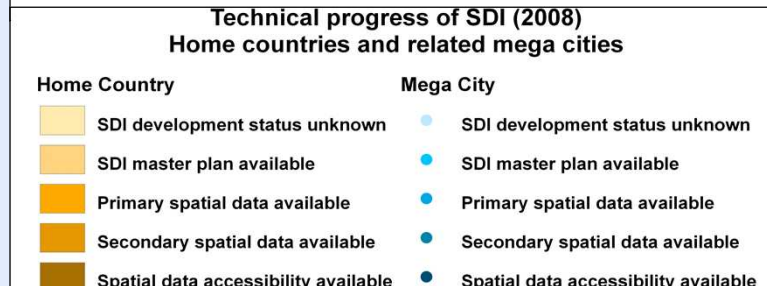
© IAU îdF 2008 - Référentiel territorial du projet de SDRIF  
source : Schéma directeur de la région Île-de-France, projet adopté par délibération du Conseil régional le 25 septembre 2008, sous réserve de contrôle de légalité

# SDI application in the African Region (2008)



## Results

- No findings for **Egypt** and **Cairo**
- **Nigeria** has developed a countrywide SDI Master plan and one for **Lagos state**



# Digital Egypt (2009)



- WebGIS- Application launched in April 2009
- Development of a private Egyptian company
- Covers Governorate of Cairo, cities of Sharm El Sheilh, Hurghada, the Northern Coast and 122 cities as point objects

- Search for real estate and properties
- Find businesses
- Locate streets and landmarks
- Measure distances and areas
- Obtain point coordinates

# Digital Egypt (2009) Search for properties

The screenshot shows a web application interface for property search. It features a map on the left and a 'Property Details' pop-up window in the center. The 'Property Details' window contains the following information:

**Property Details**

Listing ID: 68

**About the Owner / Submitter**

Name:	Adel Yassin	Email:	Not Supplied
Mobile Phone:	Not Supplied	Office Phone:	0122400071

**About the Property/Real Estate**

Sector:	El Qahera El Gedida - New Cairo Area	City:	Cairo City
Property Type:	Villa	Property Purpose:	For Sale
Price:	Not Supplied	Property Address:	Fifth Settlement, First Area, Second Sector

**Description:**  
 Superlux finished Villa, basement, ground and three levels. 1350 sq. m. land area, 300 sq. m. building area. Large swimming pool and a nice garden. Basement has 3 bathrooms, open kitchen and a reception. Ground floor is a reception, office, bathroom, laundry room and main kitchen. First floor is 5 bedrooms, 4 bathrooms and an open kitchen. Second floor is an apartment with 300 sq. m. area, 3 bedrooms and 2 bathrooms. Third level is a 170 sq. m. apartment and the remainder is a roof. Private garage and elevator.

**Pictures:**

Below the description are three small thumbnail images of the property. An 'OK' button is located at the bottom of the 'Property Details' window.

To the right of the map is a 'Property Pictures' window showing a large, multi-story villa with a swimming pool. An 'OK' button is located at the bottom of the 'Property Pictures' window.

# Digital Egypt (2009) Search for landmarks

**Digital Egypt** GIS Information Portal

All | Display Mode | Selected Locations | Quick Find

**Landmark Search Results**

Single click on any field to be zoomed in automatically. Double Click for details window. Maximum of 500 results are only displayed.

Landmark Type	Landmark Name	Landmark Sector	Landmark City
Schools	Sakanat El Ma'adi School	Ma'adi Area	Cairo City
Schools	Wadi Degla Language Scho	Ma'adi Area	Cairo City
Schools	Hadayek El Ma'adi Seconda	Ma'adi Area	Cairo City
Schools	El Gabarty Preparatory Sch	Ma'adi Area	Cairo City
Schools	El Ma'adi El 'Askareya Seco	Ma'adi Area	Cairo City
Schools	El Fath (Fat7) Private Azhar	Ma'adi Area	Cairo City
Schools	El Amal Language School	Ma'adi Area	Cairo City
Schools	El Azhar Preparatory School	Ma'adi Area	Cairo City
Schools	Fatayat El Ma'adi Azhar Inst	Ma'adi Area	Cairo City
Schools	El Amal Language School	Ma'adi Area	Cairo City
Schools	El 'Oruba Language School	Ma'adi Area	Cairo City
Schools	Misr American College	Ma'adi Area	Cairo City
Schools	Muhammed Amin El Refa'y (R	Ma'adi Area	Cairo City
Schools	El Gil El Gedid School	Ma'adi Area	Cairo City
Schools	Atef El Sadat Secondary Sc	Ma'adi Area	Cairo City

Close

Open Search Panel

# Cascading Services linking EU Regional level, National level and Local level SDI's



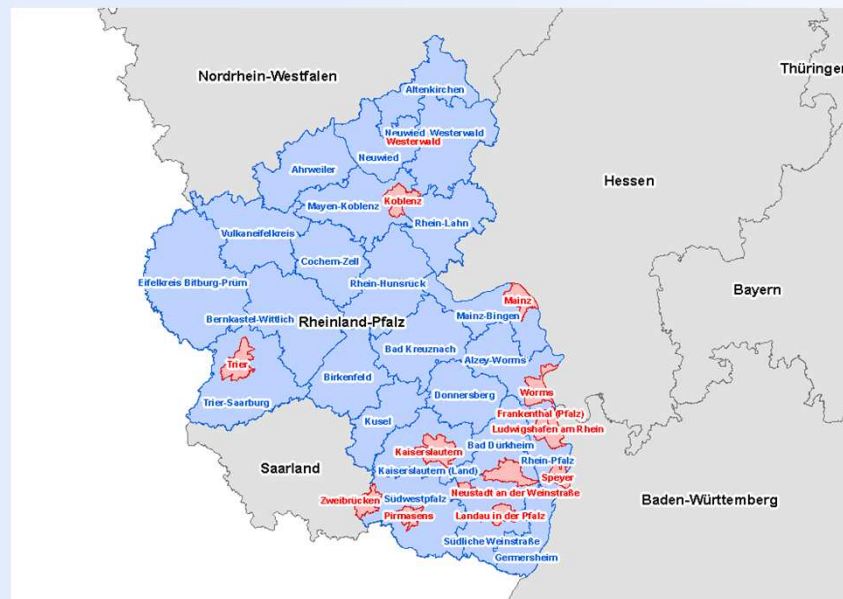
# Cascading Services linking EU Regional level, National level and Local level SDI's

The screenshot displays the GeoPortal.rlp website interface. At the top, there is a search bar with the text "Adresse, Karte, Daten, ..." and a search button. Below the search bar, there are three numbered steps: 1. DATEN SUCHEN, 2. ERGEBNIS WÄHLEN, and 3. KARTE ANZEIGEN. The main content area features a large map of Hatzenport with various overlays and a sidebar with navigation options like "Themenbereiche", "Stichwörter", and "Kartenkombinationen". Below the main map, there are several smaller map thumbnails with titles such as "Karte der Stadt und Luftbild", "Bodenrichtwerte in Koblenz (BORIS.RLP)", "Topographische Karte", "Flurkataster - Geobase-Karte im RLP-Netz", "Globale Daten", "Wie sauber ist mein Bachwasser?", "BORIS.RLP Premium 2010 (Freizeitaktivitäten)", "Biga 2011 Festzug Elberfeld", "Wo ist die schönste Gegend?", and "Karte: Erdbeben in Nassau". On the right side, there is a "PROTOTYP MOBILE" section with a QR code and a "MELDUNGEN" section with news items dated 10.05.11, 09.05.11, and 20.04.11.

# Federal Structure of Federal Republic of Germany

## Federal State of Rheinland-Pfalz consisting of 24 counties

-  Federal States (16)
-  Federal State of Rhineland-Palatinate
-  Independent cities in Rheinland-Palatinate (14)
-  Counties in Rhineland-Palatinate (24)





# Geospatial basic data countrywide available in Germany

Real estate record (left), Real estate map (right),

Source: Landesamt für Vermessung und Geobasisinformation Rheinland-Pfalz

AUSZUG AUS DEM LIEGENSCHAFTSKATASTER - Liegenschaftsbuch -		Flurstück	072521-009-00072/002.00		0
Flurstücks- und Eigentümnachweis		Datum	11.05.2007		Seite 1
Katasteramt	0221	Vermessungs- u. Katasteramt Bernkastel-Kues Im Viertel 24 54470 Bernkastel-Kues Telefon 0 66 31 / 59-0			
Gemarkung	072521	Wittlich			
Gemeinde	07231134	Wittlich			
Kreis/Stadt	0043	Bernkastel-Wittlich			
Finanzamt		Bernkastel-Wittlich			
Gmkg	Flr	Flurst-Nr	P	Status	0
072521	009	00072/002	0	Entstehung	1968/00075-01
				Fortführung	2008/03096-NA
				Liegensch.Karte	55.6438 A, 24
Lage	11828	Altricher Weg			
	11945	Kurfürstenstraße 16			
Tatsächliche Nutzung	7318 m <sup>2</sup>	21-111	Gebäude- und Freifläche - öffentliche Verwaltung		
	100 m <sup>2</sup>	21-421	Park		
	320 m <sup>2</sup>	21-512	Einbahnige Straße		
Fläche	7738 m <sup>2</sup>				
Klassifizierung	320 m <sup>2</sup>	33	Straßenflächen		
	320 m <sup>2</sup>	33-350	Gemeindestraße		
Summe	320 m <sup>2</sup> Emz 0				
Hinweise	41	Denkmalschutz			
Amtsgericht	2408	Wittlich			
Grundbuchbezirk	072521	Wittlich			
Bestand	072521-06131	7	Bvnr	5047	(N) Normaleigentum
0001.00.00.00.00	Landkreis Bernkastel-Wittlich				

Seite 1 / 1



# Geospatial basic data countrywide available in Germany

Digital orthophoto (left), topographic map (half left), digital height model (half right), digital landscape model (right)

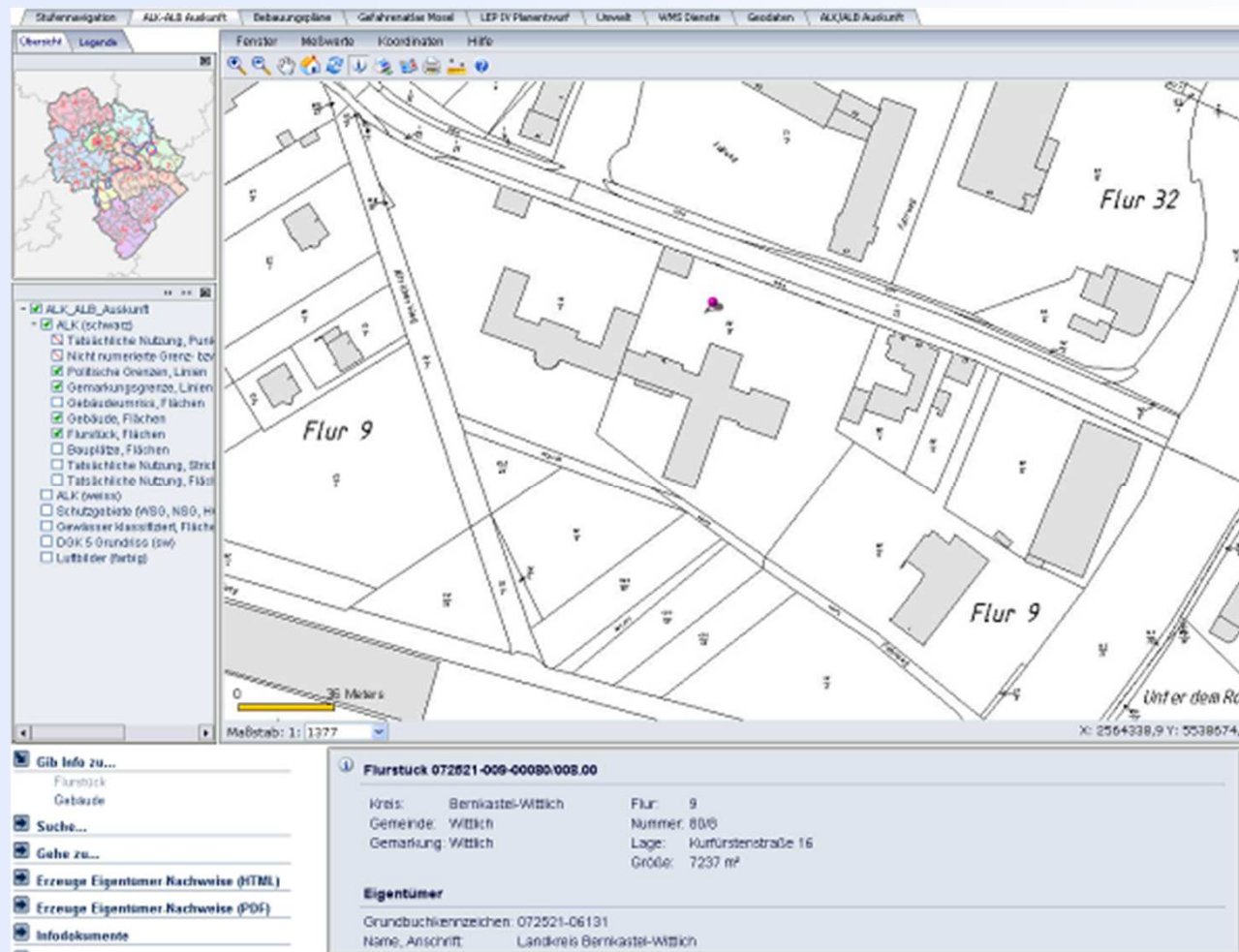
Source: Landesamt für Vermessung und Geobasisinformation Rheinland-Pfalz



# Use of Geospatial Basic Data across County Administration Departments

Information retrieval from automated land survey register (ALK) and automated register of real owners (ALB)

Source: County administration of Bernkastel-Wittlich



# Applications in the Department of Buildings and Environment

OGC Web Map Service WMS Protection areas (left), direct link to the describing textual information (right)

Source: County administration of Bernkastel-Wittlich

The screenshot shows the ArcMap interface with a WMS map of protection areas. The left pane lists various layers, including 'Biotopkartierung Rheinland-Pfalz, Erhebung...' and 'Naturpark'. The main map area displays a topographic map with colored and hatched protection areas. A browser window is open on the right, displaying the following information:

**FFH-Gebietsnummer, -Name und Gebietsgröße [ha]**

FFH-Gebietsnummer	Name	Gebietsgröße [ha]
6008-301	Kautenbachtal	685 ha

**Lebensraumtypen mit EU-Code des Anhangs I und Arten des Anhangs II der FFH-Richtlinie (92/43/EWG), prioritäre Lebensraumtypen und Arten sind mit \* gekennzeichnet. Stand Nachmeldung 2006 (31.01.2006)**

Fließgewässer	3260
Feuchte Hochstaudenfluren	6430
Flachland-Mähwiesen	6510
Silikat-Schutthalden	8150
Silikatfelsen mit Felsspaltenvegetation	8220
Pionierasen auf silikatischen Felsenkuppen	8230
Hainsimsen-Buchenwald (Luzulo-Fagetum)	9110
Labkraut-Eichen-Hainbuchenwald (Galio-Carpinetum)	9170
Schlucht- und Hangmischwälder *	9180 *
Erlen- und Eschenauenwald, Weichholzaunenwald *	91E0 *
Cottus gobio (Groppe)	
Myotis bechsteini (Bechsteinfledermaus)	
Myotis dasycneme (Teichfledermaus)	
Myotis myotis (Großes Mausohr)	

**Lebensraumsprüche der gelisteten Arten:**

<b>Säugetiere</b>	
Fischotter	Saubere Bäche und Flüsse. Artenreicher Wald und Wiesen in der Umgebung.
Luchs	Großflächige und strukturreiche Laubwälder.
Bechsteinfledermaus	ausgeprägte Waldart; Baumhöhlen als Quartier und Jagdgebiet im Wald und angrenzenden Wiesen.
Großes Mausohr	Wochenstubenkolonien meist in großen Dachräumen. Bevorzugte Jagdbiotope sind Wälder und strukturreiche Lebensräume.
Mopsfledermaus	Sommerquartier in Stammrissen oder unter abstehender Borke; alte Laubwälder; Winterquartiere in ungestörten Stollen.

# Applications in the Department of Buildings and Environment

Interactive Processing of building permit applications by using WMS providing for legally binding land-use plans

Source: County administration of Bernkastel-Wittlich

The screenshot displays a GIS application window titled ':mikropro Bauamt - [Masken-Ansicht]'. The interface includes a menu bar, a search bar, and a main map area. The map shows a plot in Hunolstein with various colored overlays representing planning data. A sidebar on the left contains a legend with checked items like 'ALK (schwarz)', 'Beisistopographie Lieg.', and 'Gebäudeumrisse rot'. A 'Daten Fenster' (Data Window) is open at the bottom right, displaying metadata for a 'DataFrame' layer.

**Legend:**

- ALK (schwarz)
- Beisistopographie Lieg.
- Nicht nummerierte Grenz.
- Beisistopographie Lieg.
- B-Pläne Geltungsbereich
- B-Pläne Geltungsbereich
- Beisistopographie II. ALK, Fläche
- Gebäudeumrisse rot
- Denkmäler (Gebäude)
- Denkmäler
- Denkmäler (Punkte), ke
- Gebäude, Flächen
- Flurstücksgrenzen (blau)

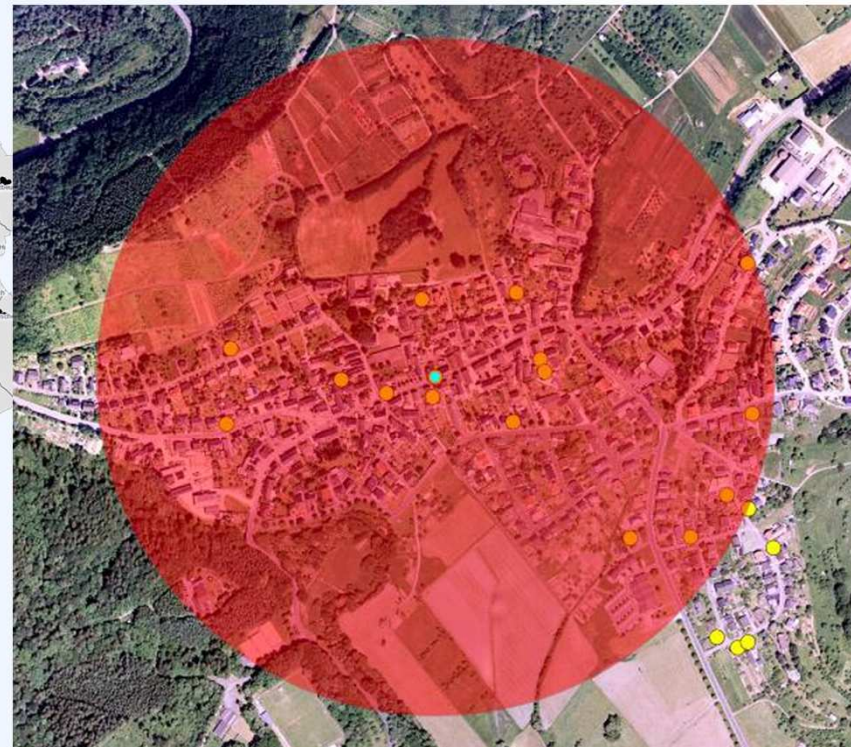
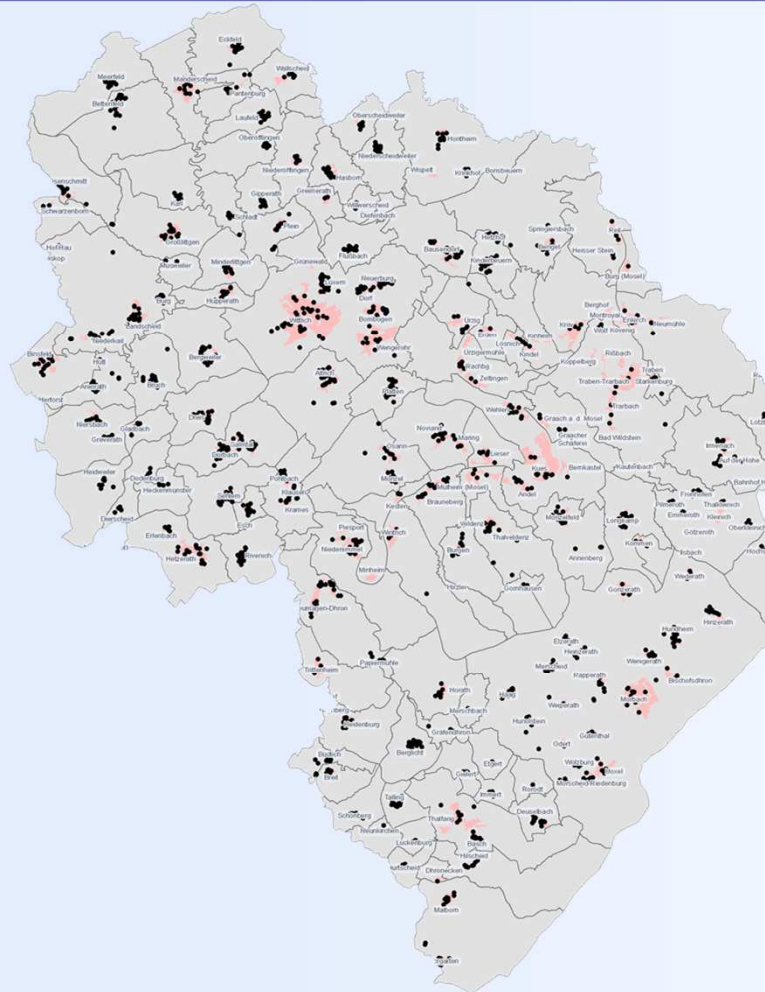
**Daten Fenster:**

Interne Name: DataFrame  
 Funktion: Dieses Fenster dient zur Ausgabe von Daten und deren Weiterverarbeitung.  
 Aus-/Einblenden: Dieses Fenster kann über das Menü "Ansicht" ein- oder ausgeblendet werden.

## Applications in the Health Department

Simulation of avian influenza case and resulting possibly affected locations

Source: County administration of Bernkastel-Wittlich



## Applications in the Planning Department

Examination of potential locations for wind power stations

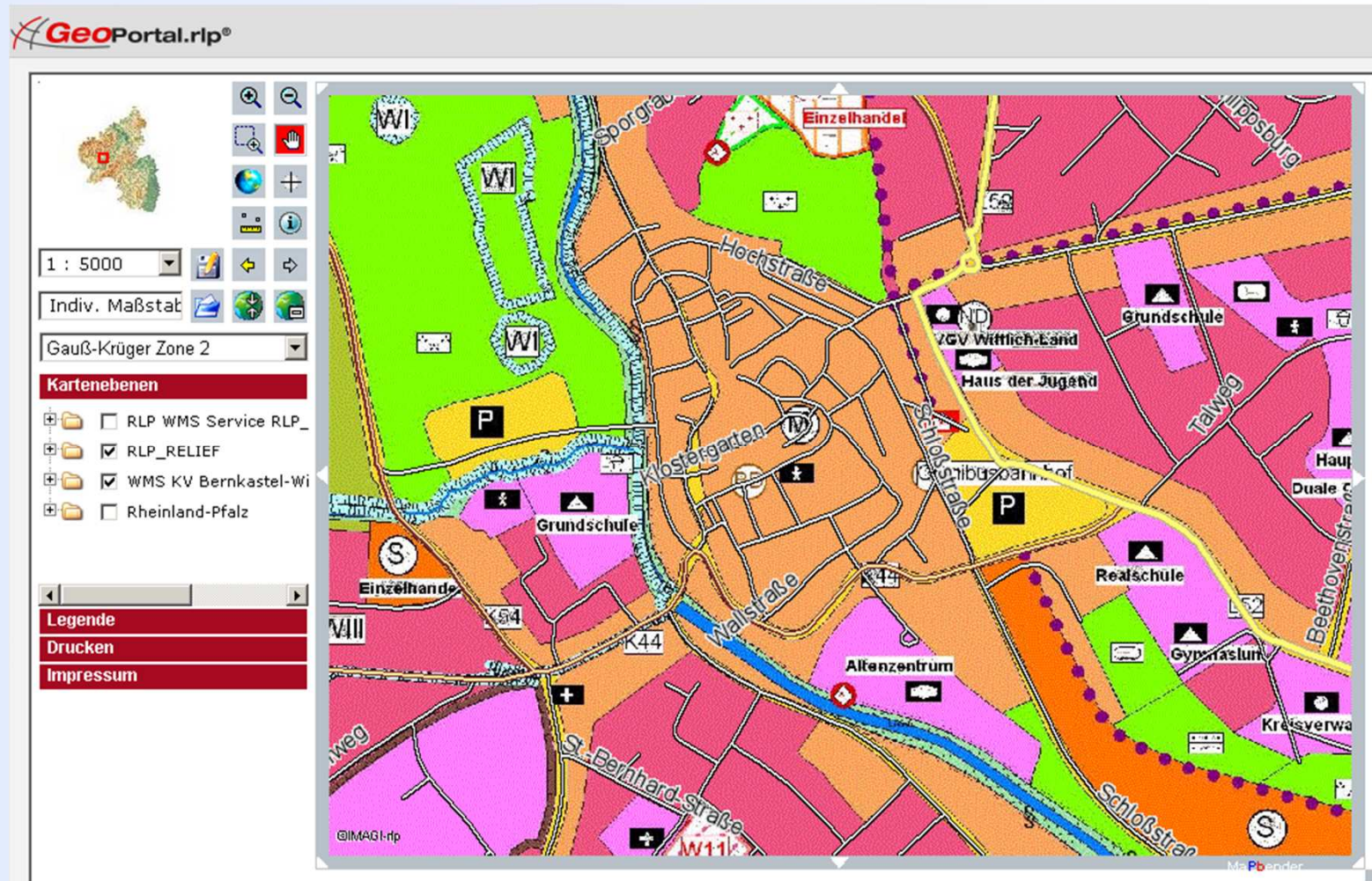
Source: County administration of Bernkastel-Wittlich



# Integration of commune SDI into GDI-RP federal state SDI

Preparatory land-use plan within federal Rheinland-Pfalz state SDI provided by county administration

Source: <http://www.geoportal.rlp.de/>

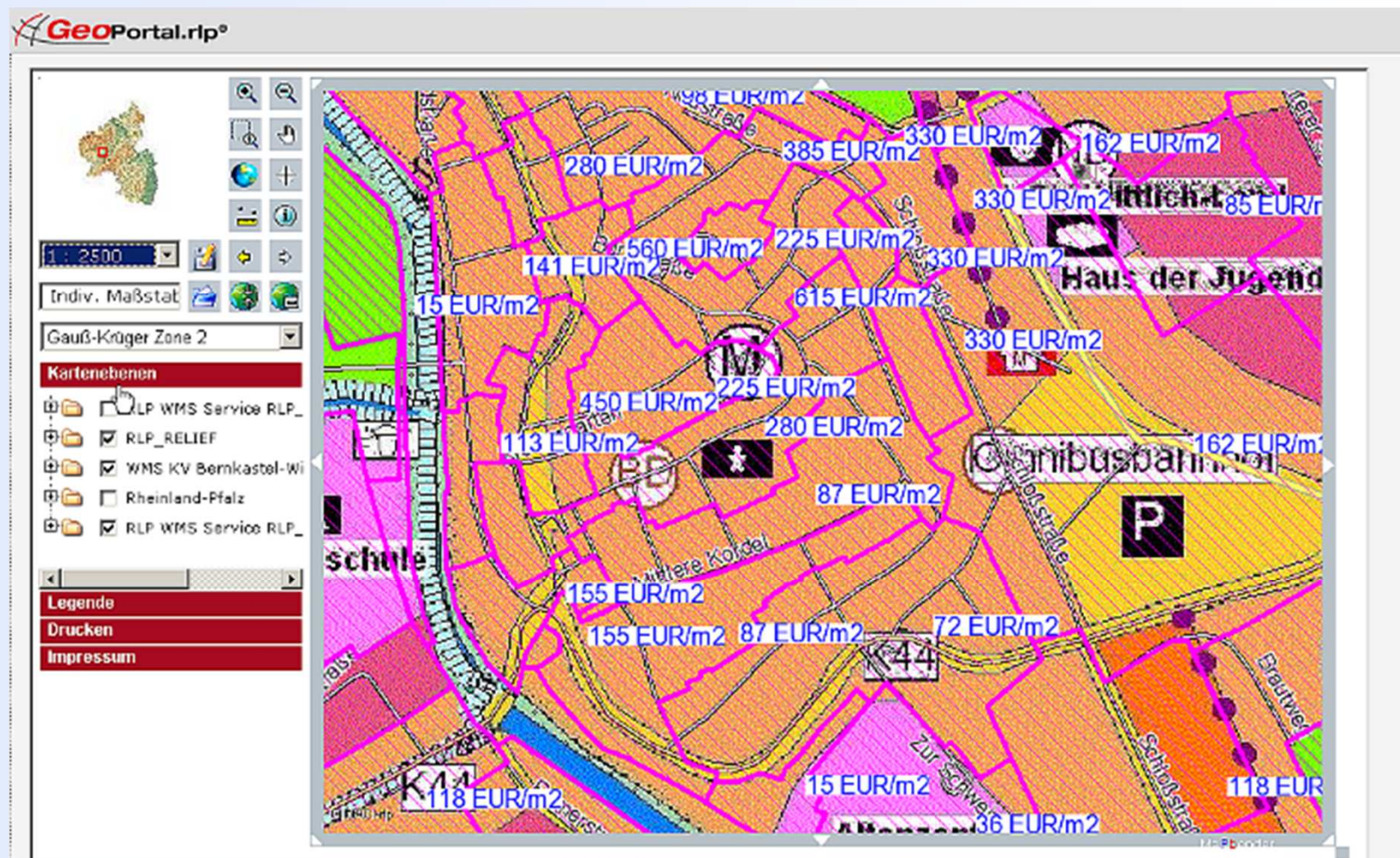




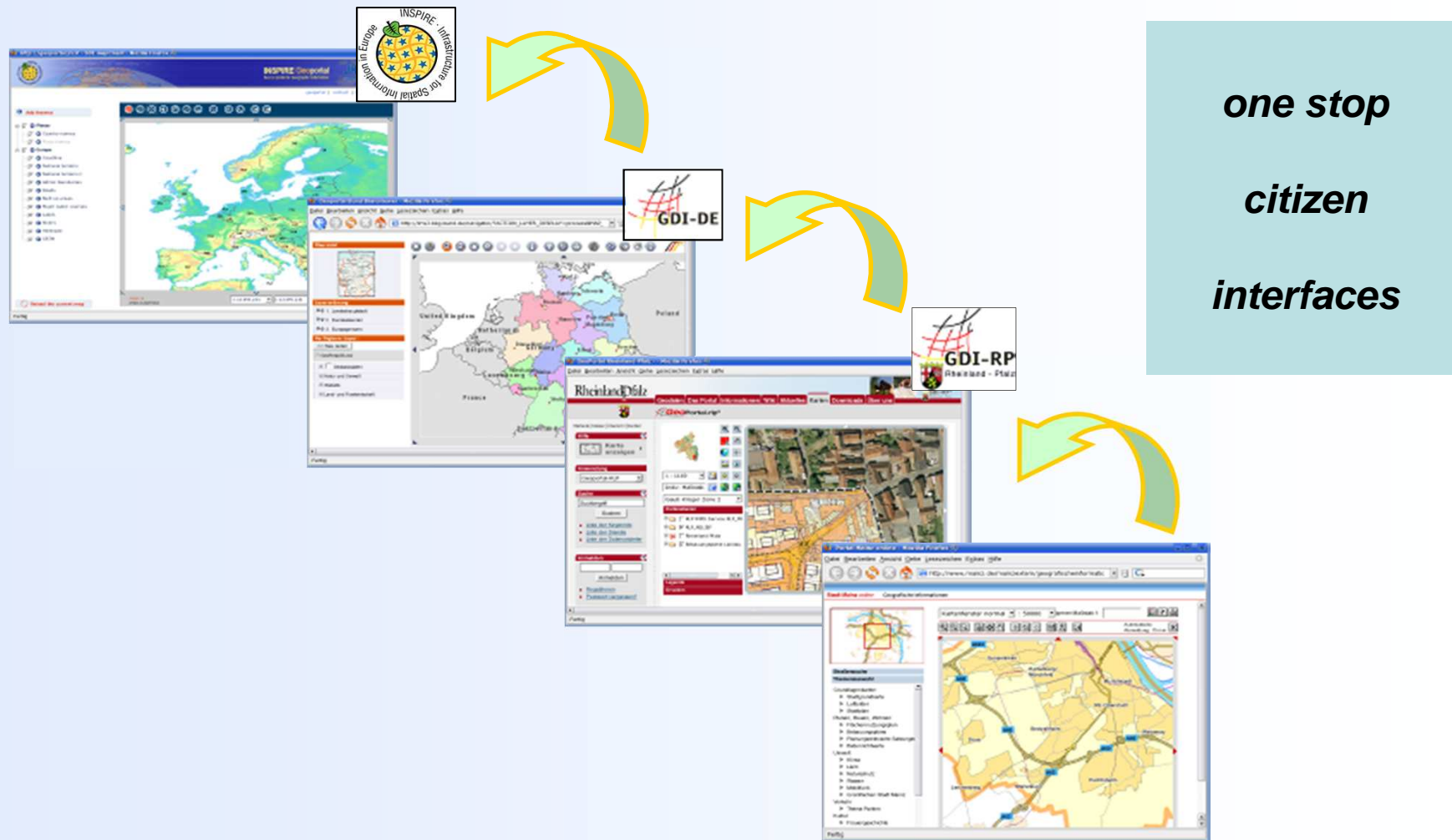
# Integration of commune SDI into GDI-RP Federal State SDI

Provision of preparatory land-use plan and land values within federal state SDI

Source: <http://www.geoportal.rlp.de/>



# Cascading Services linking EU Regional level, National level and Local level SDI's



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## Some Conclusions (1)

- The challenges to implement an operational SDI at the SDI levels GSDI, RSDI, NSDI, LSDI are considerably different.
- The Sub-National level of public administration is particularly important, because many spatially related decisions are taken at the Sub-National level and, consequently, because many geospatial data exist at that level,
- The efforts to establish working SDI's are taken more or less seriously in different regions of the world.
- Sub-National SDI's form important components in layer oriented SDI's

## Some Conclusions (2)

- SDI implementation at all levels enables to fulfil many basic needs of citizens and public administration by providing many basic spatial data in needed formats
- Careful SDI design and implementation at the local level is indispensable for establishing a working SDI at all higher levels
- Consideration of standards, mainly those defined by OGC makes it possible to integrate local SDI bricks smoothly into an overall SDI
- Many questions concerning semantic interoperability, metadata specification and maintenance not yet answered in a sufficient way

## Further Work (1)



- **FIG Working Period 2011 - 2014**
- **FIG Commission 3 Working Group 3.1  
Spatial Information Management**
- Core Topic for the term 2011-2014
- **Spatial Information Management in Urban Areas**





## Further Work (2)

- **FIG Commission 3 Working Group 3.1 Spatial Information Management**  
Chair Hartmut Müller
- **Spatial Information Management in Urban Areas**
- **Work Plan 2011 – 2014**
- Build on a number of FIG Publications already available (No. 48 Rapid Urbanization and Mega Cities: The Need for Spatial Information Management, Research Study by FIG Commission 3, and other FIG publications)
- Cover the complete scale of urban areas in terms of population (small and medium size towns up to mega cities, inhabitants 500.000+ )
- Use the FIG infrastructure – network (partnerships and co-operation agreements),

- Would you like to join our team of FIG Commission 3?

- Welcome!

Thank you for your attention!

[mueller@geoinform.fh-mainz.de](mailto:mueller@geoinform.fh-mainz.de)

