

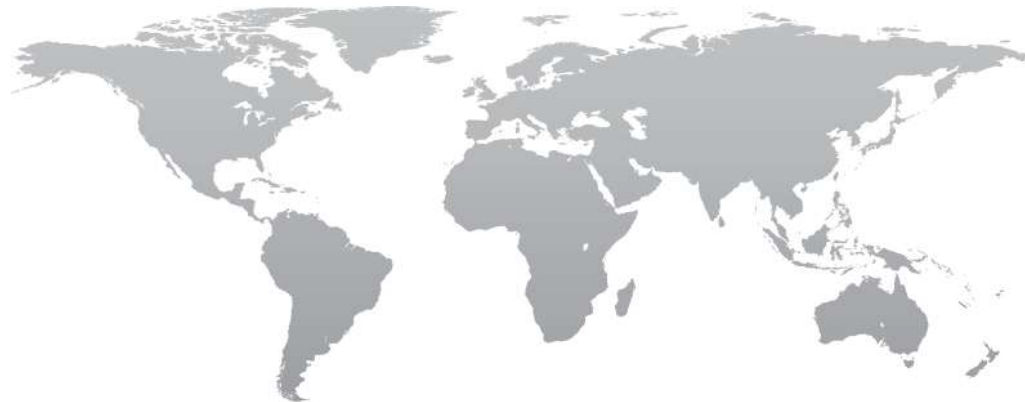
Performance Assessments of Nat. Spatial Data Infrastructures

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Melbourne University, Australia

EuroSDR



Outline

- Introduction to SDI assessment
- SDI assessment approaches worldwide (*SDI-Readiness, Clearinghouse Suitability, Organisational, State of Play*)
- Concluding remarks



Outline

- **Introduction to SDI assessment**
- SDI assessment approaches worldwide (*SDI-Readiness, Clearinghouse Suitability, Organisational, State of Play*)
- Concluding remarks



Introduction



Which computer is better?

Which car is better?



➤ **Assessing performance and impact is done everywhere**

- ☞ Government / Private sector / ... / Individual
- ☞ International / National / sub-national / ... / Organisations

➤ **Different types and different goals**

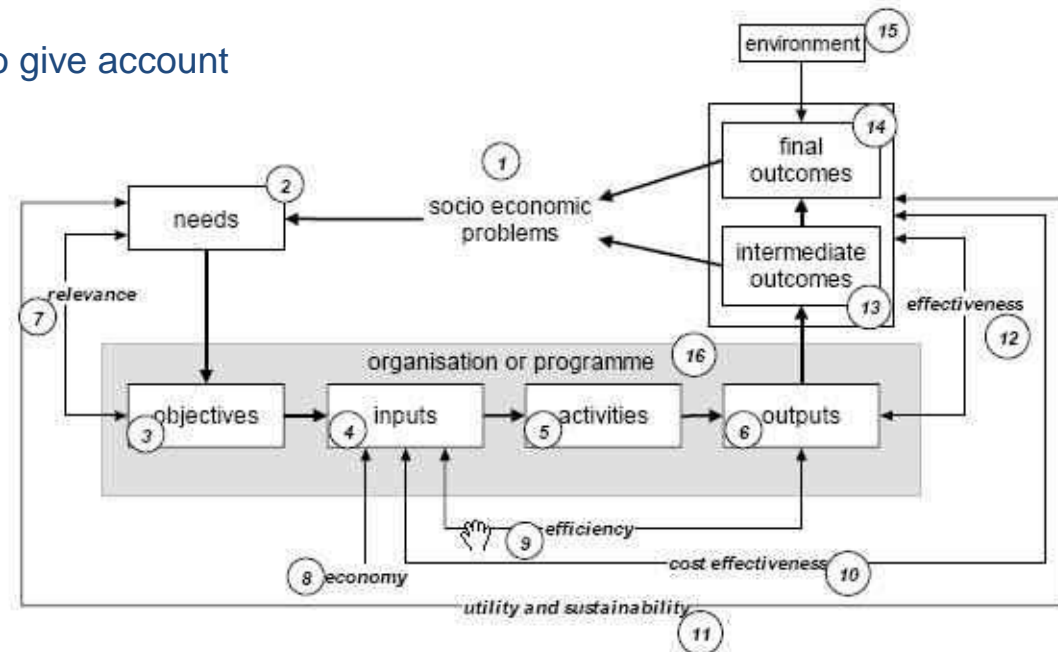
- ☞ E.g. Cost/benefit and ROI
- ☞ E.g. Impact assessment

➤ **Impact assessments**

- Impact assessment is the process of identifying the future consequences of a current or proposed action
- Ex ante / ex post
 - Estimating the impact of a measure before it is implemented
 - Measuring the impact (result) after the measure has been taken
- In almost all sectors of government
 - Social impact analysis, Regulatory impact assessment, Environmental impact assessment

➤ Performance assessment and management

- Performance relates to output and outcomes of processes
 - At micro, meso and macro levels
- Performance assessment is the bundle of activities aimed at obtaining information on performance
 - Mostly quantitative, more and more qualitative
- Performance management aims to incorporate and use performance information in the decision-making process
 - To learn, to steer & control, to give account



Van Dooren, W., G. Bouckaert and J. Halligan, 2010. Performance Management in the Public Sector. Routledge, London

Which SDI is better?



Which SDI is better?



بنية التحتية للبيانات المكانية لإمارة أبوظبي
Abu Dhabi Spatial Data Infrastructure

MyGDI Sabah
 Bridging Sabah's Geospatial Framework

Welcome

Background: Malaysia Geospatial Data Infrastructure (MyGDI) is a national project to create a Spatial Data Infrastructure (SDI) to allow geospatial information sharing among data providers for every local region for the state of Sabah. MyGDI Sabah is a state-level SDI to promote the sharing of metadata and geospatial data among data providers in the government sector. It aims to serve the GIS Community more effectively through the MyGDI Sabah Clearinghouse which is the central Portal allowing on-line dissemination of framework data, metadata and standards.

Public Channel

Sabah Backup

Sectoral Application

Geospatial Discovery Channel

Map of Transportation

Inter-Gov Channel



goodata.gov
 U.S. MAPS & DATA

Search goodata.gov

What: (e.g. River) Where: (e.g. Missouri, MO)

Current Featured Topic: Administrative and Political Boundaries

New 2009 Census Tiger Line Files are now available!

2009 TIGER/Line® Shapefiles

What are the TIGER/Line Shapefiles?

NATIONAL SPATIAL DATA INFRASTRUCTURE FOR BOTSWANA

GOVERNMENT OF BOTSWANA



The Canadian Geospatial Data Infrastructure



Architecture Description Version 2.0



INSTITUTO GEGRÁFICO AGUSTÍN CODAZZI

Quiénes Somos

Gestión Institucional

Áreas Estratégicas

Productos y Servicios



IDERC Portal Geoespacial Nacional

¿Qué es la IDER? | ¿Qué es Geoespacial? | Noticias | Eventos | Enlaces | Contacto

¿Qué es la IDERC?



NGIIP National Geographic Information Infrastructure Programme



➤ Why SDI assessments?

- **There might be several reasons**

- Motivate budgets
- Describe a specific status
- Evaluate certain choices
- Because of legislation
- Highlight good practices
- ...

- **In general several aspects are covered**

- Measure what exists
- Measure the usage, usability
- Measure the impacts, benefits

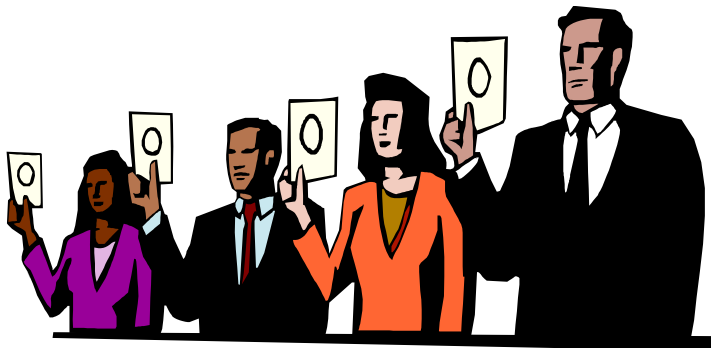
➤ Criteria for SDI assessment

- Relevant
- Efficient
- Effective
- Satisfactory
- Sustainable (social, economic, environmental)
- Compliant
- Coherent
- Well used



➤ SDI complexity

- Multi-objectives
- Multi-stakeholders
- Multi-definitions
- Multi-understandings
- Multi-criteria
- Multi-scale
- Multi-sectors
- Multi-purposes to assess



Principles for assessment

- Serve multiple purposes of assessment
- Use multiple assessment methods and approaches
- Do not oversimplify
- Incorporate different views/understandings
- Maintain Flexibility
- Reduce bias
- Provide the full picture



Outline

- Introduction to SDI assessment
- **SDI assessment approaches worldwide (*SDI-Readiness, Clearinghouse Suitability, Organisational, State of Play*)**
- Concluding remarks



SDI assessment

➤ Previous SDI assessment – Research

Ian Masser (1999)

Rajabifard et al. (2003): typology of SDI

Steudler et al. (2003): Evaluation and Performance indicators

Van Orshoven & Vandenbroucke (2003 ...): INSPIRE State of Play

Kok & Van Loenen (2004): Organisational/Institutional

Delgado et al. (2005): SDI-Readiness

Rodriguez Pabon (2005): Theoretical framework to assess SDI

Cromptvoets (2006): Clearinghouse Suitability Index

Lance et al. (2006): SDI control evaluation

Giff (2006): Performance based management

Grus et al. (2007, 2008): Complex Adaptive Systems > Multi-view framework

**Different assessment orientations, different approaches,
different sampling methods, different levels, different definitions**

Relatively new field



Book edited by Cromptvoets, Delgado, Rajabifard and van Loenen, 2008, University Press Melbourne



➤ Previous work / research

- Readiness Index
- Clearinghouse Suitability Index
- Organisational
- INSPIRE & NSDI State of Play

➤ Readiness index - Delgado Fernández

➤ Objective:

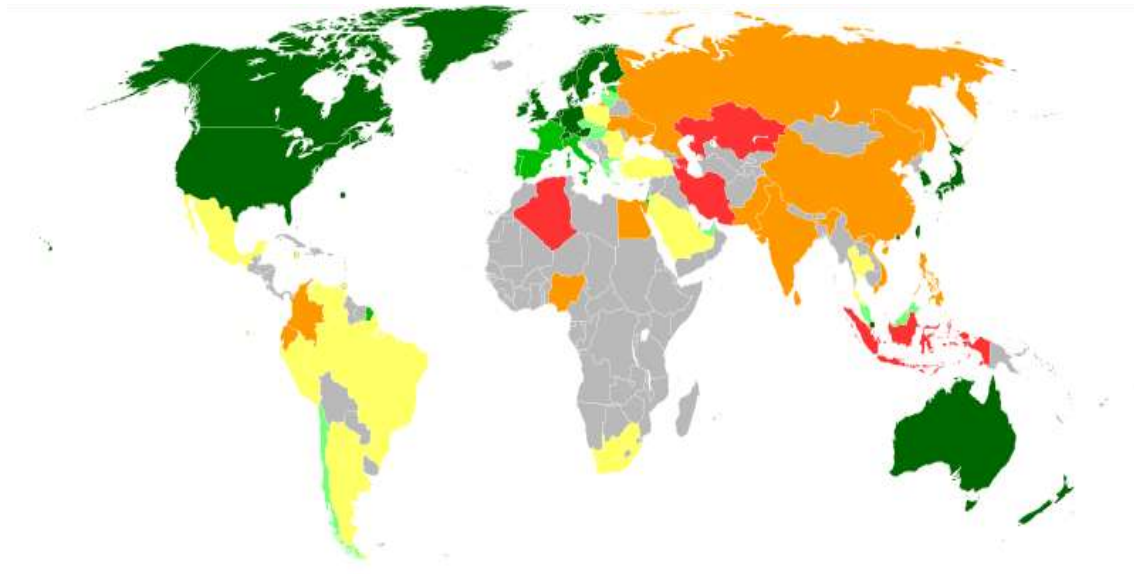
- Assessment of pre-existing infrastructures (WWW and communication) and the analysis of other social, organizational and culture factors

➤ Method:

- Through a survey that only authorized experts of a country are able to complete
- Use of indices based on a fuzzy-based model, supported by a new multivalent logic system called Compensatory Logic

➤ Result:

- SDI readiness index: Degree to which a country is prepared to deliver its geographical information in a community



Croatia SDI-Readiness factors and index

Factor	Value
Organisation	75
Information	42
Human resources	68
Technology	67
Financial resources	37
SDI-Readiness index	55

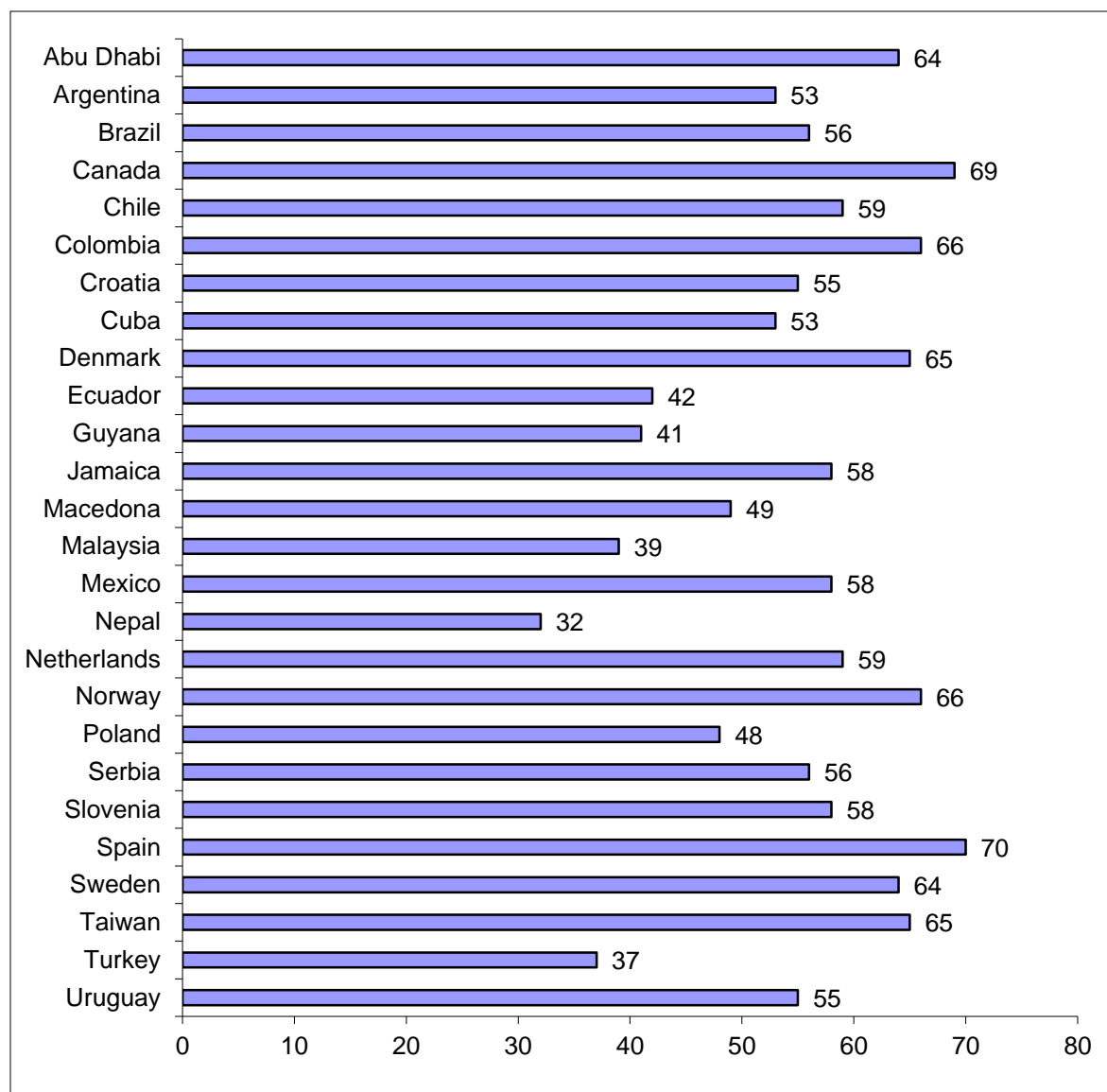
Good pre-conditions to undertake SDI

+++

Organisation + Human Resources + Technology

+ / -

Financial resources + Metadata



Slovenia: 58

Macedonia: 49

➤ Clearinghouse suitability / Geoportal index – Crompvoets

- **Objective:**
 - To have a measure of the quality and performance of a national clearinghouse as basic building block of an SDI
- **Method:**
 - A survey collects information on 15 characteristics regarding the clearinghouses
- **Result:**
 - Indices supporting clearinghouse managers in developing successful strategies to implement their national clearinghouses

Clearinghouse / Geo-portal

=

An electronic facility for searching, viewing, transferring, ordering, advertising and disseminating spatial data from numerous sources via the Internet

Geoportal as single entrance point

The screenshot displays the geodata.gov website interface. At the top, the logo "geodata.gov U.S. MAPS & DATA" is visible on the left, and the tagline "Your One Stop for Federal, State & Local Geographic Data" is centered. A navigation bar includes links for Home, Search, Maps, Marketplace, Communities, Statistics, and Help Center. The "Marketplace" link is highlighted with a mouse cursor. On the right, there are "Log in" and "Sign up" buttons.

The main content area is divided into several sections:

- Search geodata.gov:** A search interface with fields for "What: (e.g. River)" and "Where: (e.g. Harrison, NY)", a "Search" button, and a link to "Show Advanced Search Options".
- Current Featured Topic:** A section titled "Administrative and Political Boundaries" with a sub-section "Census 2008 Key Resources". It features a prominent announcement: "New 2009 Census Tiger/Line Files are now available!" with a link to the U.S. Census Bureau website.
- U.S. Census Bureau:** A banner for the "2009 TIGER/Line® Shapefiles" featuring a tiger logo.
- TIGER Navigation:** A yellow box containing links for "2009 TIGER/LINE SHAPEFILES MAIN", "DOWNLOAD SHAPEFILES", "TECHNICAL DOCUMENTATION", "USER NOTES", and "ORGANIZATION OF FILES". It also lists "PREVIOUS VERSIONS" including "2008 TIGER/LINE SHAPEFILES" and "2007 TIGER/LINE SHAPEFILES".
- What are the TIGER/Line Shapefiles?:** A section explaining that these files are extracts from the Census Bureau's database, providing a digital map base for GIS systems, including spatial data for roads, railroads, rivers, and geographic entity codes.

On the left side, there are two vertical menus:

- Communities:** Includes "Special Interest" (Earth Information Exchange, Fire Mapping, Geographic Names, Historical Collections, Homeland Security, Hurricanes, Indian Ocean Disaster, Lewis and Clark, Local Governments, Recreation and tourism, The National Atlas, The National Map) and "Data Categories" (Administrative Boundaries, Agriculture, Atmosphere, Biology, Business, Cadastral, Demographic, Elevation, Environment, Geology, Health, Imagery and Basemaps, Inland Water, Locations, Oceans, Transportation, Utilities).
- Quick Start:** A section titled "Welcome to geodata.gov" and "Your One Stop for Finding and Using Geographic Data" that lists helpful services: Find Data or Map Services, Make a Map, Browse Community Information, Cooperate on Data Acquisitions, and Publish your Data and Map Services. It also encourages users to save searches and maps, and provides a link to the Quick Start Guide.

- About GeoConnections
- User Communities
- About CGDI
- Opportunities
- News & Media
- Resource Library
- Subscribe
- My Subscription

Send to a colleague

What are you looking for?

The Discovery Portal is your gateway for:

- Thematic Data
- Topographic Data
- Satellite Imagery
- Aerial Photographs
- Organizations
- Services

Other Sources:

- Maps (Atlas of Canada)
- Free Thematic Data (GeoGratis)
- Free Base Layers of Data (GeoBase)



Success Story

GeoTango aligns with Microsoft to access worldwide market

It's the dream of every high-tech start-up: develop innovative technology, sell your company to a well-established suitor, and provide your innovation to thousands or even millions of people around the globe.



GEOIDE Market Intelligence Portal

A new section is now available on the GEOIDE website: the GEOIDE Market Intelligence Portal (English only). This section is opened to everyone (member and non member) who is interested of having the latest news from the geospatial industry.



Privacy Commissioner Seeks Information about Street Level Photography Available Online

While satellite and aerial photo images have been available for many years, it is only recently that technology has allowed for this imagery to be shared freely over the internet.

Welcome to GeoConnections

GeoConnections supports projects that enable decision-makers to use location-based information to benefit public health, safety and security, the environment, and Aboriginal communities.

Topics of importance:

- Opportunities
- Partners
- Projects
- About CGDI
- Data
- Success Stories



FOCUS ON:

Earth Observation essential for geohazard mitigation

More than 250 scientists from around the world gathered for a five-day workshop at ESA's Earth Observation Centre in Frascati.

more

News Flash:

more



Upcoming Events:

more



USEFUL TIPS FOR

- Decision-makers
- Data suppliers
- Technology suppliers
- Developers
- New Users

RESOURCES & TOOLS

- Key Documents
- Annual Report
- Glossary & Acronyms
- General FAQs



- ▶ About AD-SDI
- ▶ Our Stakeholders
- ▶ Members Only
- ▶ Abu Dhabi GIS Day
- ▶ News & Events
- ▶ Downloads
- ▶ Links
- ▶ FAQs

AD-SDI
eNewsletter



AD-SDI
Newsletter



مرحباً بكم في برنامج
تنسيق البيانات المكانية
لإمارة أبوظبي

Welcome to the
Abu Dhabi Spatial Data
Infrastructure Programme



"Geography is where we live, work, play and learn, and geographically based information gives us the means to better understand the world around us, plan effectively and comprehensively make informed decisions, and carry out the results of those decisions in a coordinated and efficient way."

Rashed Al Mansoori, Director General, Abu Dhabi Systems and Information Centre (ADSIC)

The Abu Dhabi Spatial Data Infrastructure (AD-SDI) is a programme of the Government of Abu Dhabi, administered within the Abu Dhabi Systems and Information Centre (ADSIC) e-government programme to facilitate the sharing of geospatial data among government agencies and other stakeholders.

Now in Stage 2 of the project, AD-SDI has come a long way since its launch in June 2007. With many new stakeholders contributing to the development of the programme, this vital e-government service is moving ahead swiftly with a number upcoming events including the GIS Day Abu Dhabi 2009 in November. Below are some of the key milestones reached in the project:

- Technical Committee established
- Working Groups and Spatial Interest Groups established
- Strategic Plan launched
- Geospatial Portal and Data Clearinghouse established
- Collected and consolidated existing fundamental data
- Aligned existing data collection projects
- Identified stakeholder capacity building needs

أبو ظبي
abudhabi
government portal
| Business | Citizen |

Abu Dhabi
Geospatial
Portal



Abu Dhabi
Map Book
2009



AD-SDI
Strategic Plan



FGDS





L'IDEE de l'Espagne

- ▶ Le projet IDEE
- ▶ Le Groupe de Travail IDEE
- ▶ IDEs et SIG en Espagne

Contribuer à l'IDEE

- ▶ Comment Contribuer ?

Autres services du portail

- ▶ Application du Sol CORINE
- ▶ Mesure d'Altitudes
- ▶ Transformation de Coordonnées

Ressources

- ▶ Outils software gratuits
- ▶ Exemples d'API
- ▶ Génération de métadonnées
- ▶ Système de Référence Spatiale

Il choisit l'Infrastructure de Données Spatiales de ton Région:



L'Infrastructure de Données Spatiales de l'Espagne (IDEE) a pour but d'intégrer à travers Internet les données, métadonnées, services et informations géographiques qui sont produites en Espagne, aux niveaux national, régional et local, conforme à ses cadres légaux respectifs.

Services

 Visualisation de cartes	 Catalogue	Recherche de noms géographiques 
 Téléchargement de données	 Centres de décharge	Analyse du territoire 

@ idee@ign.es

blog **IDEE**

RSS



Nouvelles

2010-11-04
Nueva Versión perfil NEM

2010-11-04
Bulletin disponible IDEs de novembre

2010-10-13
Bulletin disponible IDEs de octobre.

Documents

2010-11-04
Nueva Versión perfil NEM v 1.1

2010-07-29
Loi LISIGE

2009-01-23
Directiva INSOTRE

ACCUEIL

VOIR

GEOCATALOGUE

S'INFORMER

SERVICES



Photographies aériennes	Cartes IGN
Bâtiments	Routes
Parcelles cadastrales	Limites administratives
Unités administratives	Hydrographie

ALLER À...

Adresse complète | Nom de la commune + Mode Avancé

Adresse

Nom de la commune

J'y vais



20/10/2010

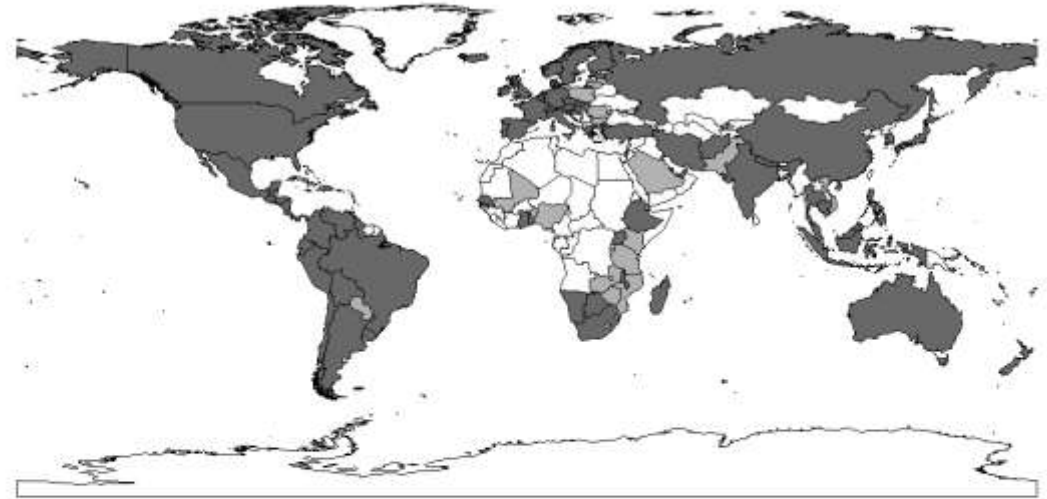
Cartographier le littoral avec Litto3D

Le programme Litto3D consiste à produire un modèle numérique altimétrique continu terre-mer sur la frange littorale. Sa mise en œuvre fait appel à des procédés innovants et très spécifiques.

API Géoportail
Les données Géoportail sur votre site

➤ Characteristics

- number of suppliers;
- monthly number of visitors;
- languages used;
- frequency of web updates;
- level of (meta)data accessibility;
- number of datasets;
- most recently produced dataset;
- availability of view services;
- number of alternatives for searching



Clearinghouse status

STATUS

- none
- project
- national clearinghouse



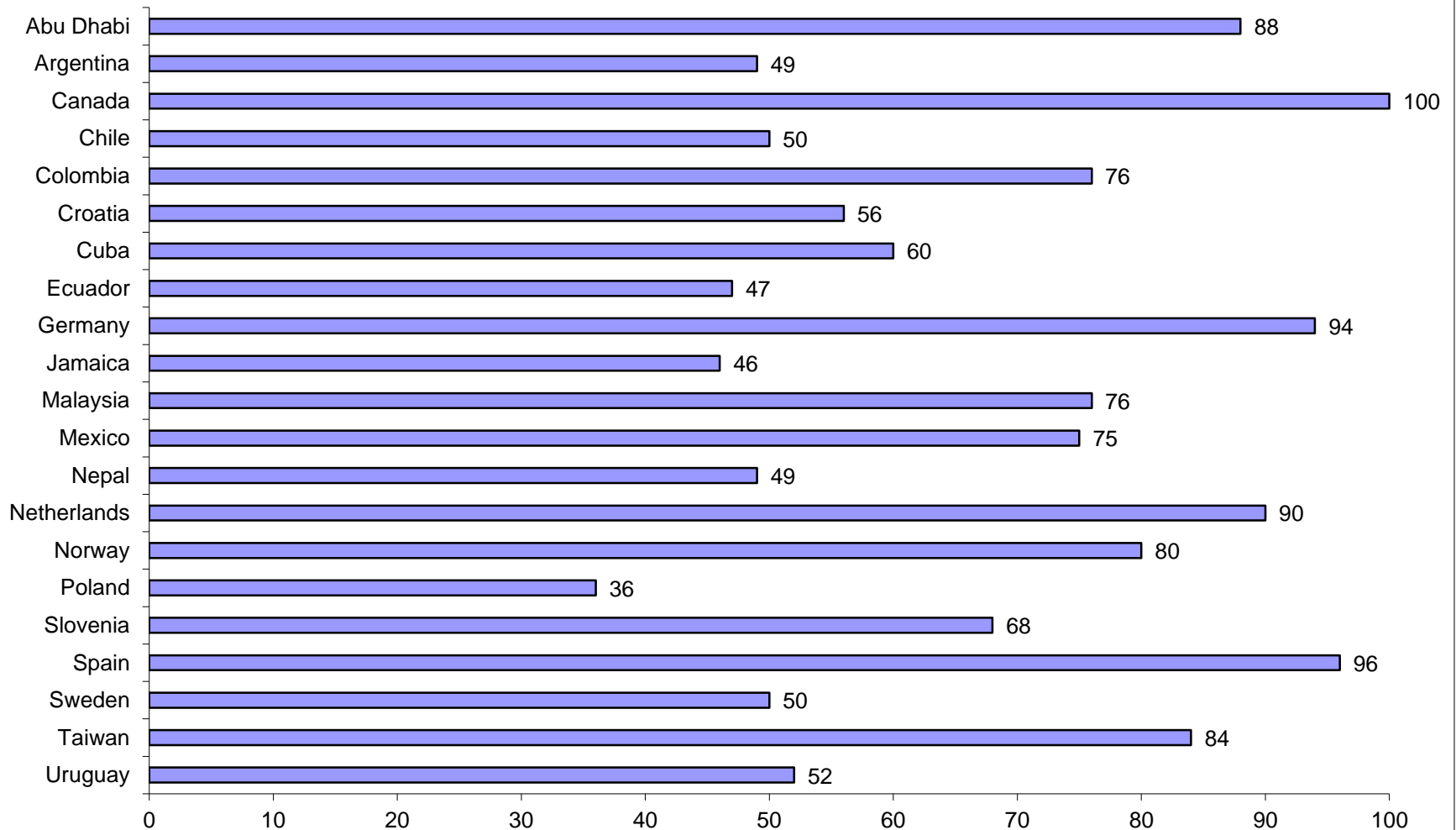
1:150,000,000

No formal National Geoportal (Several projects for setting up one!!)

Clearinghouse Suitability Index of SGA Geoportal (geoportal.dgu.hr): 56

SGA Geoportal -> Average

Slovenia: 68



Croatia SGA Geoportal Characteristics

Clearinghouse Characteristic	Class 1	Class 1 weight*	Class 2	Class 2 weight	Class 3	Class 3 weight
Number of suppliers	➤ 16	0.08	2 - 16	0.04	1	0.00
Monthly number of visitors	> 4000	0.02	150 – 4000	0.01	< 150	0.00
Number of web references	➤ 250	0.04	20 – 250	0.02	< 20	0.00
Languages used	Multilingual including the national language	0.06	Monolingual using the national language	0.03	Monolingual using no national language	0.00
Frequency of web updates (in days)	< 4	0.10	4 – 365	0.05	> 365	0.00
Level of (meta) data accessibility	Data + standardised metadata	0.10	Standardised metadata	0.05	Non-standardised metadata	0.00
Number of datasets	> 1500	0.08	50 – 1500	0.04	< 50	0.00
Most recently produced dataset (in months)	< 2	0.02	2 - 60	0.01	> 60	0.00
Decentralised network architect.	Yes	0.08	Hybrid	0.04	No	0.00
Availability of view services	Yes	0.10	Prototype	0.05	No	0.00
Number of mechanisms (alternatives) for searching	≥ 5	0.18	2 – 4	0.09	1	0.00
Use of maps for searching	Yes, by locating an area of interest	0.04	Yes, by clicking on an area with predefined boundaries	0.02	No	0.00
Registration-only access	No	0.02	Partly	0.01	Yes	0.00
Funding continuity	Continuously funded	0.01	Piecemeal funded	0.01	Never funded	0.00
Metadata-standard applied	ISO/FGDC/CEN	0.07	National	0.03	No standard	0.00



Organisational – Van Loenen

Intention to identify, describe and compare the current status of the organizational aspects of the NSDI

Assessment of characteristics of institutional components:

- leadership
 - vision
 - communication channels
 - self organising ability of sector
-
- Four stages of development
 1. Stand-alone
 2. Exchange
 3. Intermediary
 4. Network

Organisational index of Croatia SDI: 75

Leadership

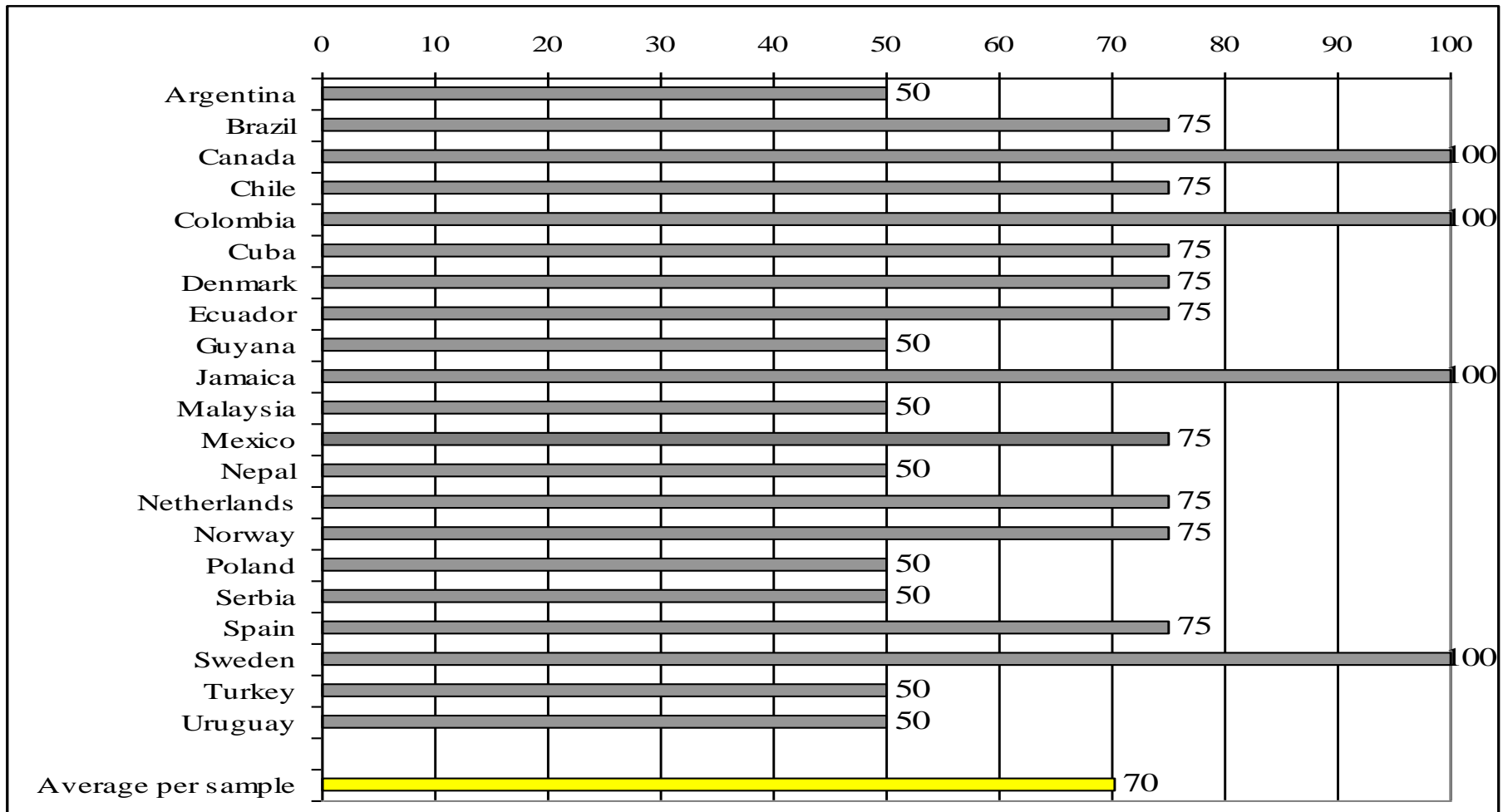
Vision

Communication channels

Self organising ability of sector (No active problem solution)

Slovenia: 75

Macedonia: 50



INSPIRE State of Play – European Commission/EuroSTAT

- **Objective:**
 - To collect, structure and assess information regarding the status of NSDI development in 34 countries in Europe with the aim to support the INSPIRE implementation process
- **Method:**
 - Based on a desktop study analysing (geo-)portals, documents, and input from experts from the different NSDI
 - The information is structured and translated into 32 indicators regarding the building blocks of the SDI: organisational, legal & funding, metadata, data, services and standards aspects
- **Result:**
 - Matrices with the indicators reveal the status of NSDI development and help determining the areas where specific measures could be taken (at EU or national level)
 - Change matrices over time

INSPIRE State of Play in Europe (2011)

Countries

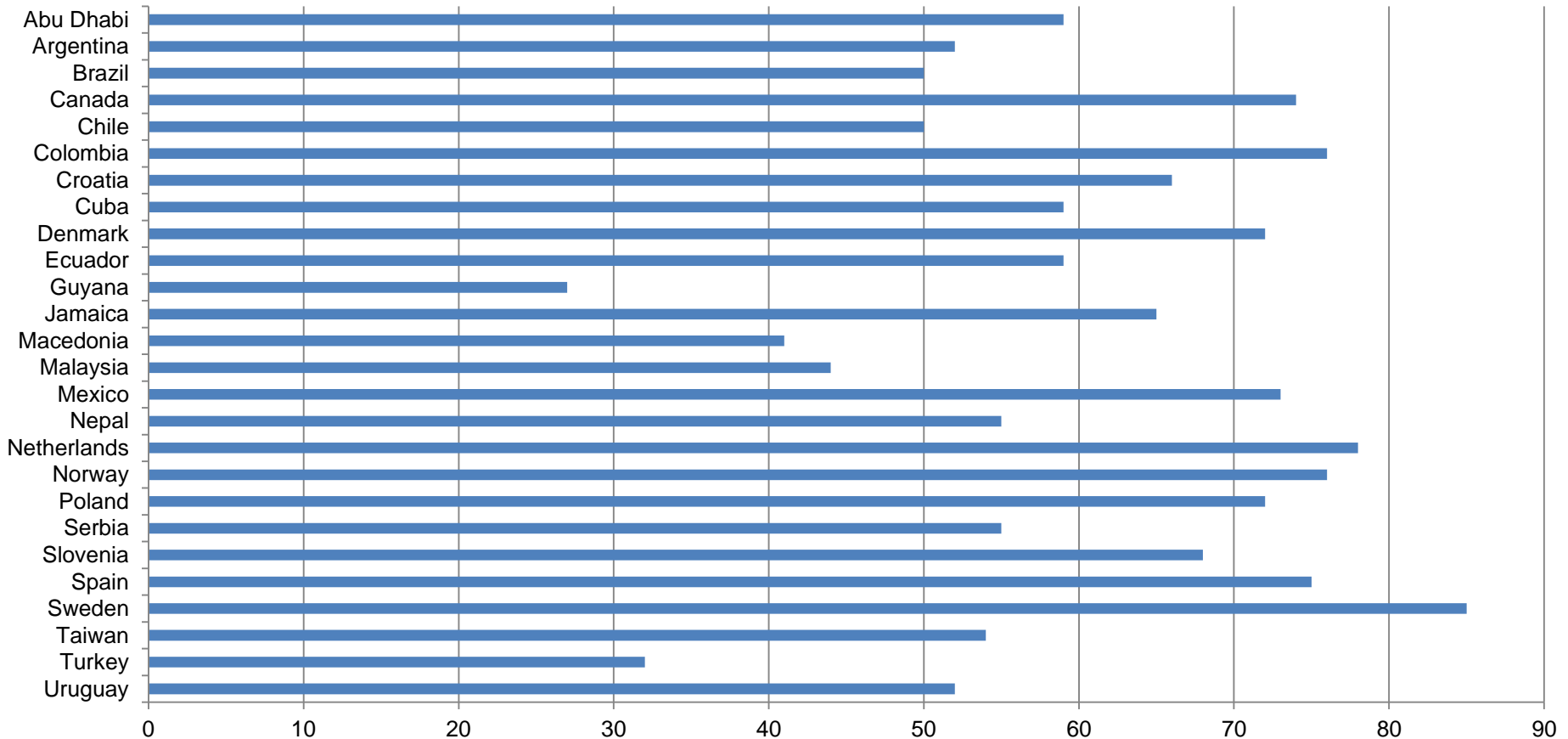
Country	Organisation							Legislation & funding									Data					Meta-data			Services					Standards (VI)	Environmental data (VII)	Country					
	Organisational issues (I)							Legal issues and funding (II)									Data for the themes of the INSPIRE annexes (III)					Metadata (IV)			Network services (V)												
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29				30	31	32		
AT		4																																		AT	
BE		3																																		BE	
DE		6																																		DE	
DK		5																																		DK	
ES		6																																		ES	
FI		5																																		FI	
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IE		4																																		IE	
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NL		5																																		NL	
PT		5																																		PT	
SE		6																																		SE	
UK		5																																		UK	
CY		2																																		CY	
CZ		5																																			CZ
EE		5																																			EE
HU		3																																			HU
LT		5																																			LT
LV		2																																			LV
MT		2																																			MT
PL		4																																			PL
SI		4																																			SI
SK		4																																			SK
BG		2																																			BG
RO		3																																			RO
HR		4																																			HR
MK		1																																			MK
TR		1																																			TR
CH		6																																			CH
IS		4																																			IS
LI		3																																			LI
NO		6																																			NO

In agreement
 In partial agreement
 Not in agreement
 Unknown

State-of-Play of Croatia SDI: 66

Organisational	80
Legal & Funding	50 (Standardised licenses, Funding)
Data	75
Metadata	66
Network Services	60
Standards	100

Slovenia SDI: 68
Macedonia: 41



Trends of NSDI developments in Europe

- Overall trends
 - Countries at different speeds and with different approaches
 - This is not necessarily a problem
 - Potentially competing and overlapping goals for different SDI initiatives
 - INSPIRE <> NSDI, INSPIRE <> eGov
 - Changed leadership and involvement of major user communities
 - From NMA having the lead to shared responsibilities
 - Dynamic sub-national initiatives and emerging local developments
 - Challenge to integrate and streamline

Each country is an habitat on its own: hence there exists a country-specific culture of dealing/sharing data with public sector and other users

Trends of NSDI developments in Europe

- Overall trends
 - The users and user communities of INSPIRE & the NSDI are not always very clear
 - They only start to emerge, if they emerge at all
 - Open data and open data policies, open source software, open standards
 - What will be the impact
 - Fast technological developments
 - Linked data, cloud computing, sensor web, ...

The complex and pressing societal problems, together with the fast technological developments require a dynamic, flexible and effective development of INSPIRE / NSDI linked to and integrated with other initiatives

Trends of NSDI developments in Europe

- Organisation
 - The `governance approach is different in different countries
 - Hierarchy <> network
 - Does not necessarily influence the results
 - Developments are mainly national
 - Good Practices for involving local levels
 - Overall maturity
 - Some countries are going fast: e.g. DE, ES, NO, CZ
 - Important progress for several countries: e.g. CH, EE, FR, IT, LT, RO, SE
 - Some are lagging behind

INSPIRE is a success story when it comes to stakeholder involvement. Also most countries succeeded in building their NSDI as a network of stakeholders



Trends and NSDI developments in Europe

- Organisation
 - Shift towards more environmental agencies leading the NSDI
 - Organisational + legislation lead
 - Operational lead mostly in the hands of the NMAs
 - ☞ Shared responsibilities and division of tasks
 - Large majority of the countries involve users
 - Generally speaking the knowledge about the users, the usage of the infrastructure, and the user needs is limited
 - But involvement of non-public sector could improve
 - Non-profit + Private sectors only partially active
 - No structured involvement universities for education / research

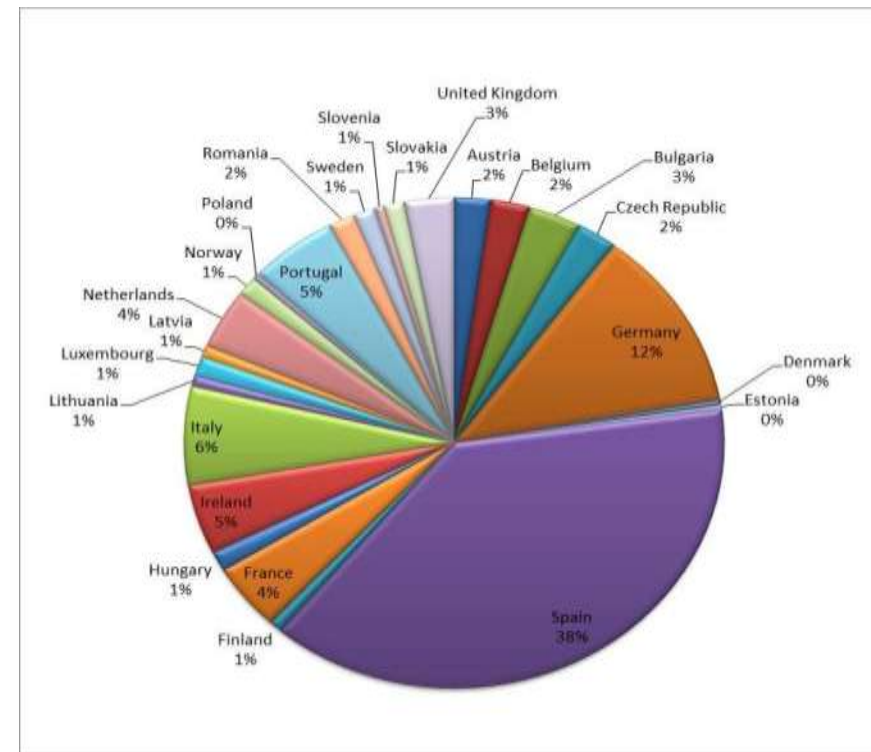
Trends and NSDI developments in Europe

- Legal issues and funding
 - Establishment of national legal framework in most countries
 - Limited number of implementation strategies and plans
 - Good Practice: UK location strategy
 - More and more countries take into account other legal aspects
 - PSI, privacy, IPR issues, ...
 - Framework for sharing between public authorities improved
 - Funding remains a concern

Practice of sharing is not really known. There has been overall improvement but still too many barriers exist.

Trends and NSDI developments in Europe

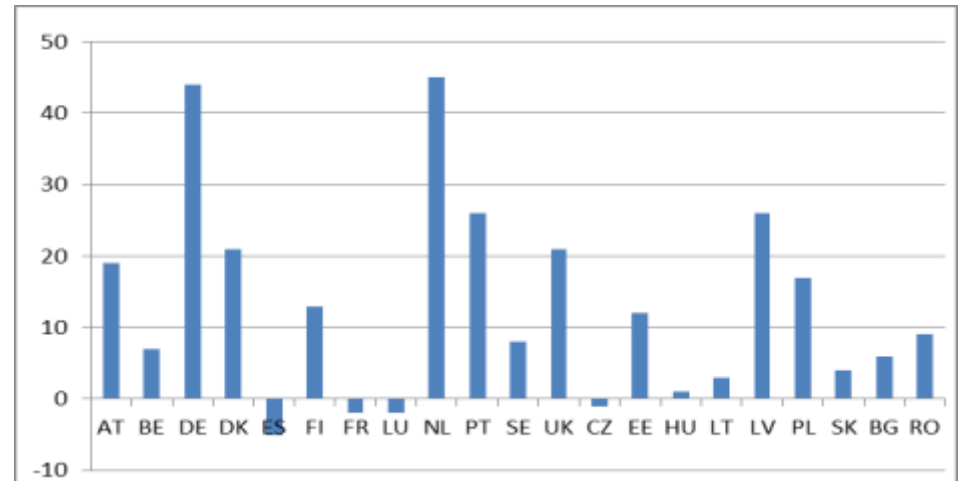
- Spatial data
 - 2010: 13,796 data sets reported
 - There are many more existing data sets
 - The spatial coverage of the data is no problem
 - Interoperability of spatial data sets – Just starting to implement the rules for data specification



Number of datasets

Trends and NSDI developments in Europe

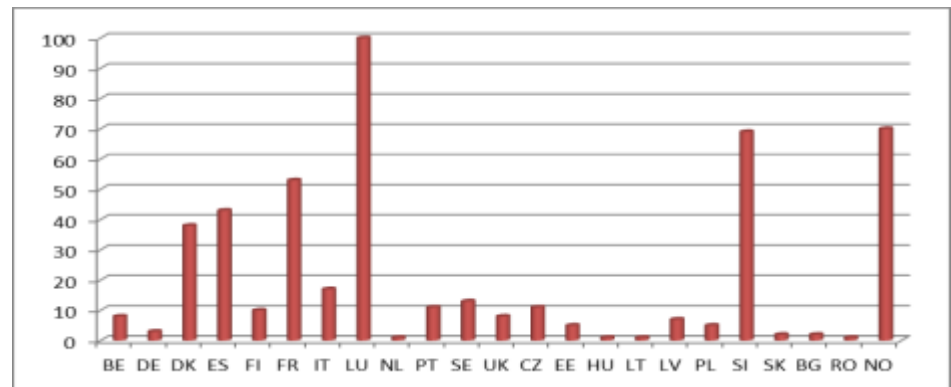
- Metadata
 - Variable among the Member States
 - There is clear progress between 2009 – 2012
 - Conformity



Increase of metadata (2009 – 2012)

Trends and NSDI developments in Europe

- Network services
 - Discovery of spatial data sets and services remains a concern
 - Viewing and downloading services
 - More and more are emerging and they are reported
 - Other services emerge as well
- Standardisation – increased active involvement

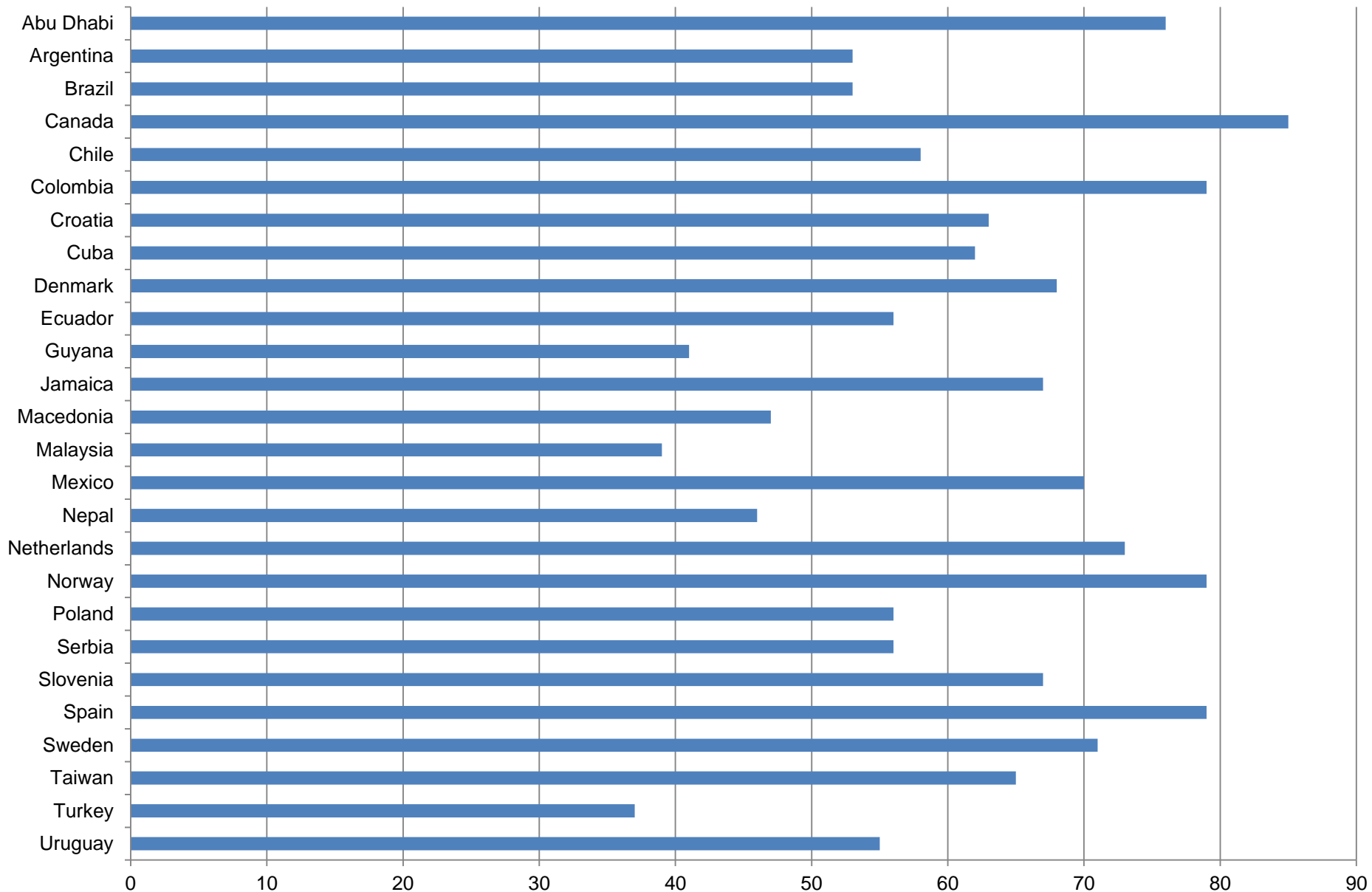


% of reported datasets that can be viewed

Technological components are being developed at a fast pace

Overall assessment for Croatia SDI (av. 4 approaches): 63

Slovenia: 67 & Macedonia: 47



Outline

- Introduction to Performance Measurement and SDI assessment
- SDI assessment approaches worldwide (*SDI-Readiness, Clearinghouse Suitability, Organisational, State of Play*)
- **Concluding remarks**



Concluding remarks

➤ **Worldwide SDIs are implemented**

- Producers as well as users are cooperating and coordinating their efforts aiming at the further development of SDIs
- Setting-up data geoportals to access spatial resources through web services
- Taking into account legal and other aspects such as IPR, security, privacy, ...

➤ **Those SDIs are more and more intertwined with eGov developments**

➤ **There is a need to assess SDIs to understand**

- What exists and is available
- What is the use
- What is the impact on what we do and on society as a whole
- How well we are doing as compared to others



➤ **SDI assessment is a new field of research**

- Different approaches and different purposes
- They help to better understand what is working well, and what not, and which areas need our attention

➤ **The experiences on SDI assessment elsewhere in the world can be helpful for the Croatia SDI**

- The way stakeholders are involved
- The information that is collected and how this done
- The way the information is processed / used
- The usage of the performance measurement

➤ **Croatia SDI**

- *Average SDI Readiness*
- *No formal Geoportal -> SGA Geoportal: Slightly below average*
- *Average SDI Organisation*
- *Average INSPIRE State of Play*

(Nat. Geoportal, Metadata, Funding policy need attention)

Thanks for your attention!!

Questions?

