



THE WORLD BANK
Working for a World Free of Poverty



Introduction to Spatial Data Infrastructure

Bishwa Pandey
The World Bank

Contents

- * Spatial Data Management in the Caribbean
 - * Background/Purpose
- * Concept of Spatial Data Infrastructure (SDI)
- * Technological structure
- * Benefits
- * SDI use in Disaster Risk Management, land use management
- * Current use trends
- * Challenges in SDI implementation

Background

The mission of The World Bank's Latin America and the Caribbean Region (LCR) Disaster Risk Management (DRM) team is to work with national and local governments and with communities to identify hazard risk, assess vulnerability to adverse natural events and mitigate the impact of disaster through structural and non-structural measures, including risk financing and transfer.

Spatial Data is the **key** to the analysis.

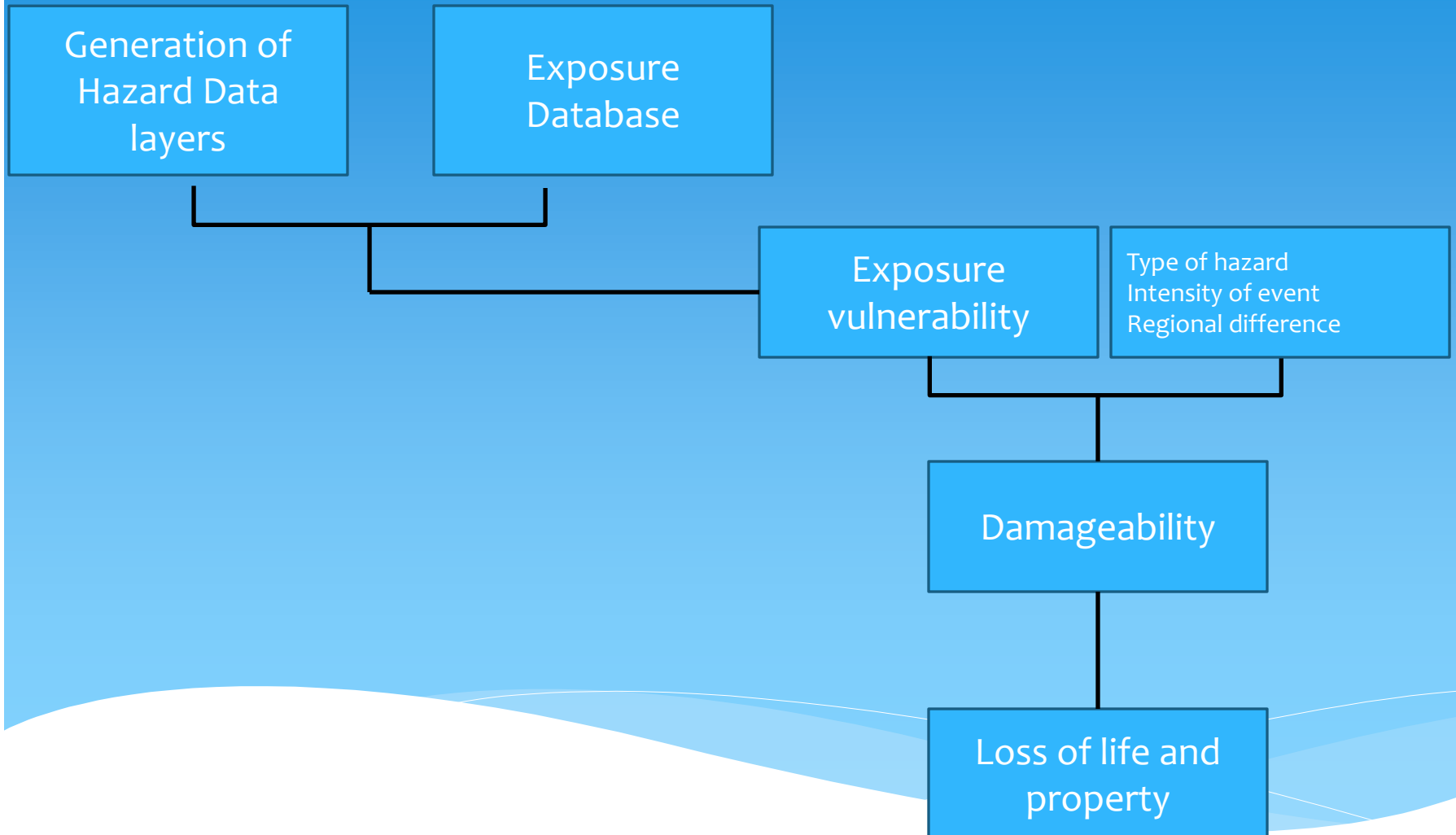




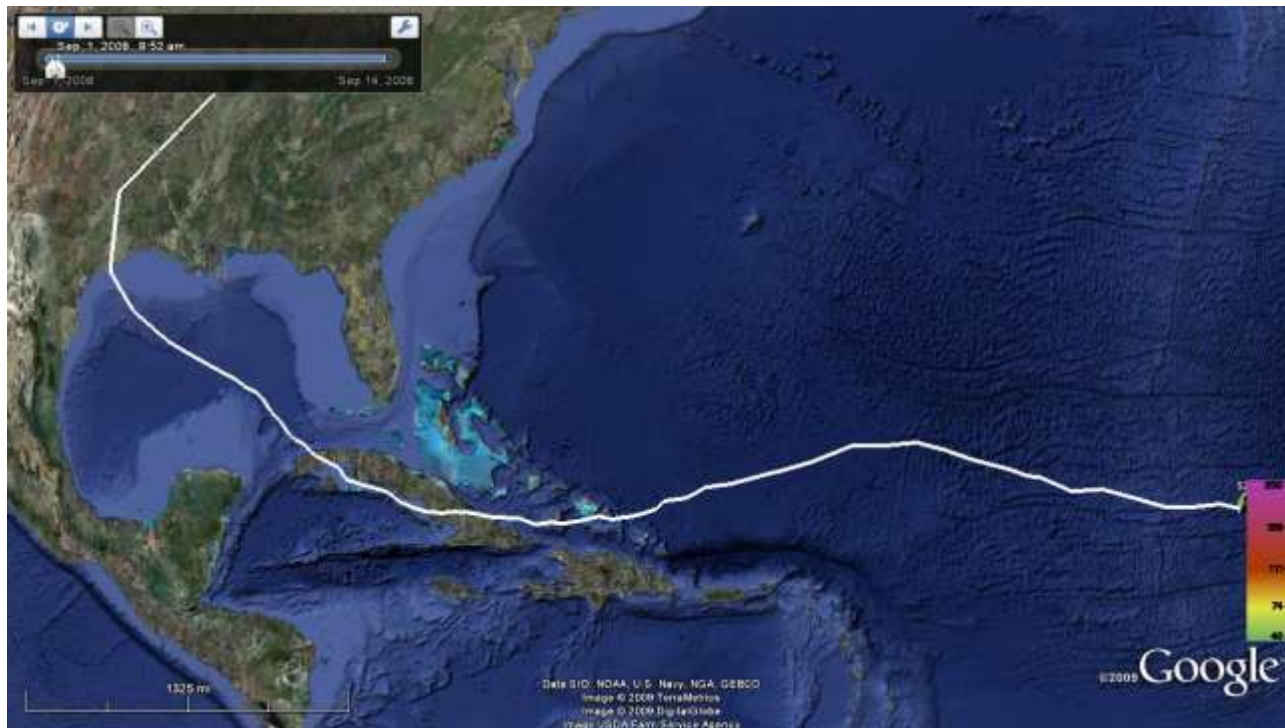
Building resilience and better decision-making

- * Latin America and the Caribbean (LAC) region is one of the most vulnerable region with respect to natural disasters
- * 20 countries in LAC region have half of the GDP exposed to natural disasters
- * Damages due to natural hazards happen because of **HOW** and **WHERE** we build
- * The key is using (geospatial) data in decision making process

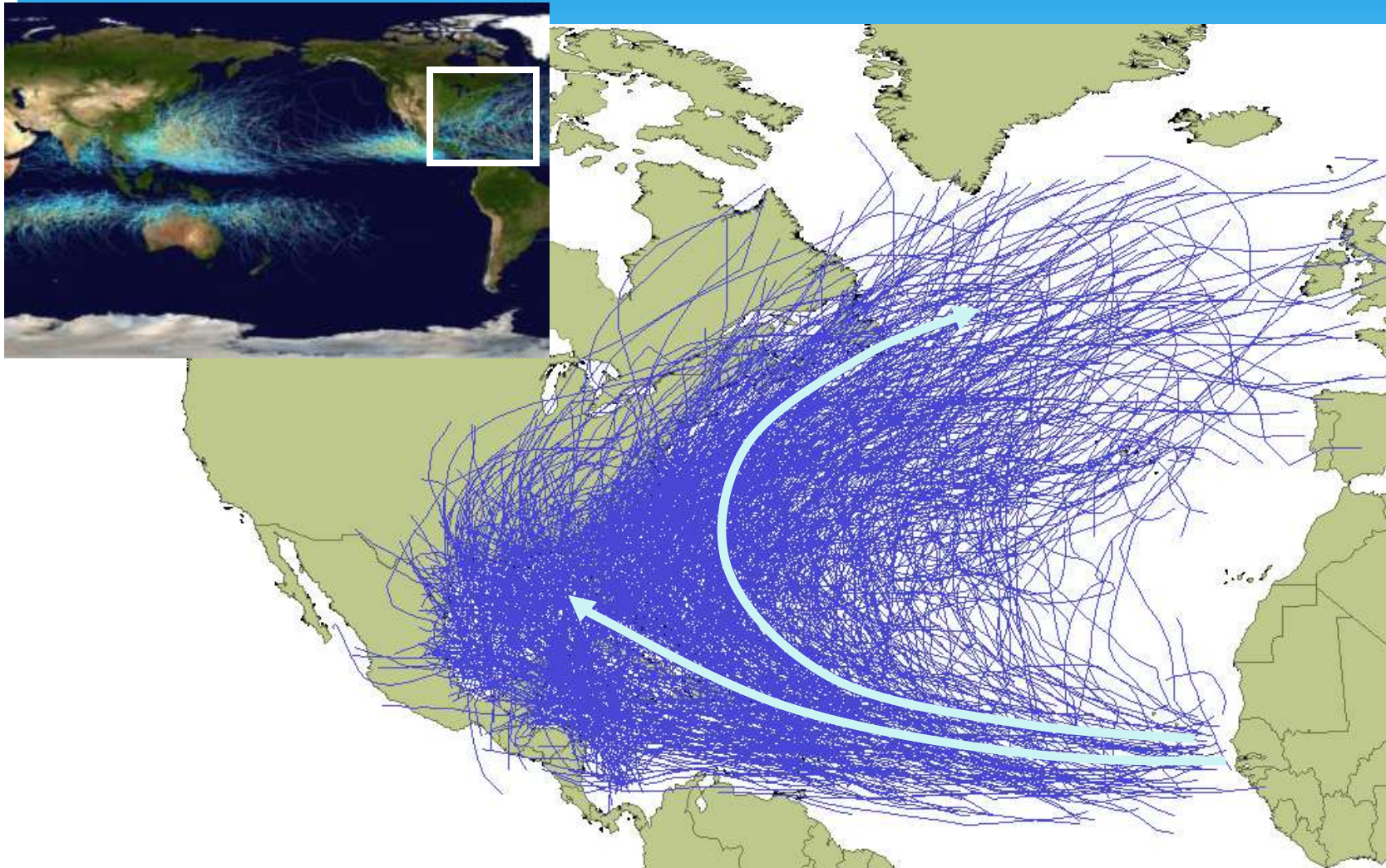
Risk Assessment Process



Simulation of Hurricane Hazard



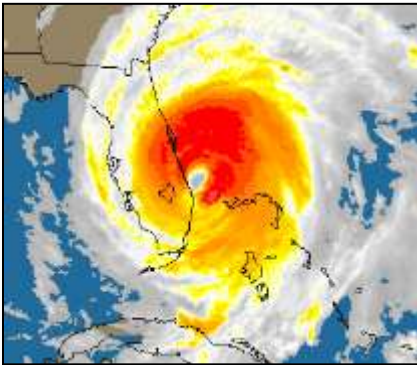
Historical Tracks since 1900



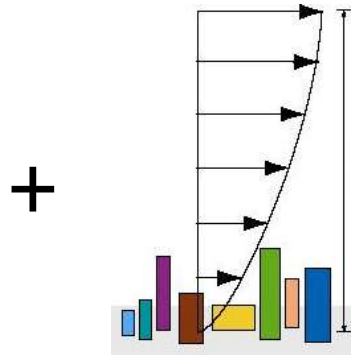
Since 1900, over 900 tropical cyclones have formed in the North Atlantic.

Calculation of damage and loss (Risk)

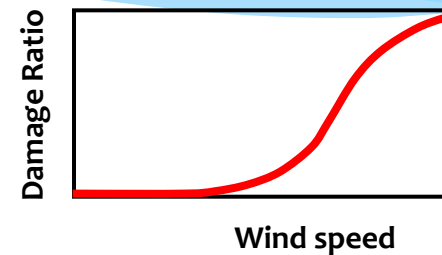
Event Footprint



Local Intensity Calculation



Damage Estimation



Loss of life, injury / Displacement
Loss in monetary values

Exposure Database

Spatial Data layers and attributes


- * Location, Footprints (Buildings, Assets)
- * Primary characteristics – Geometry, Orientation, construction class, occupancy, roof types, roof geometry, roof slope, roof built, wall, stories, age, foundation, ornamentation ... etc
- * Secondary characteristics - Soft story, Pounding by nearby buildings, loose debris, Trees, Large missile object, Terrain roughness, Irregular structure, Retrofit, Glass material type... etc

Exposure



Feature Info

to_buildings.11362



2 / 2

Name	Value
age	0
attrsource	ADB-PED 2010
bldg_id	TO-TO-004356
b_frame1	LOAD BEARING WALL
c_exist	False
defect1	NONE
featsource	SOPAC 2010
followup	False
found1	SLAB
found_br1	NONE
f_area	2197
f_maxht	0.2-0.3 M
f_minht	0.2-0.3 M
g_slope	FLAT
id	4356
machine	SB1
mainuse	COMMERCIAL
nav_id	2527

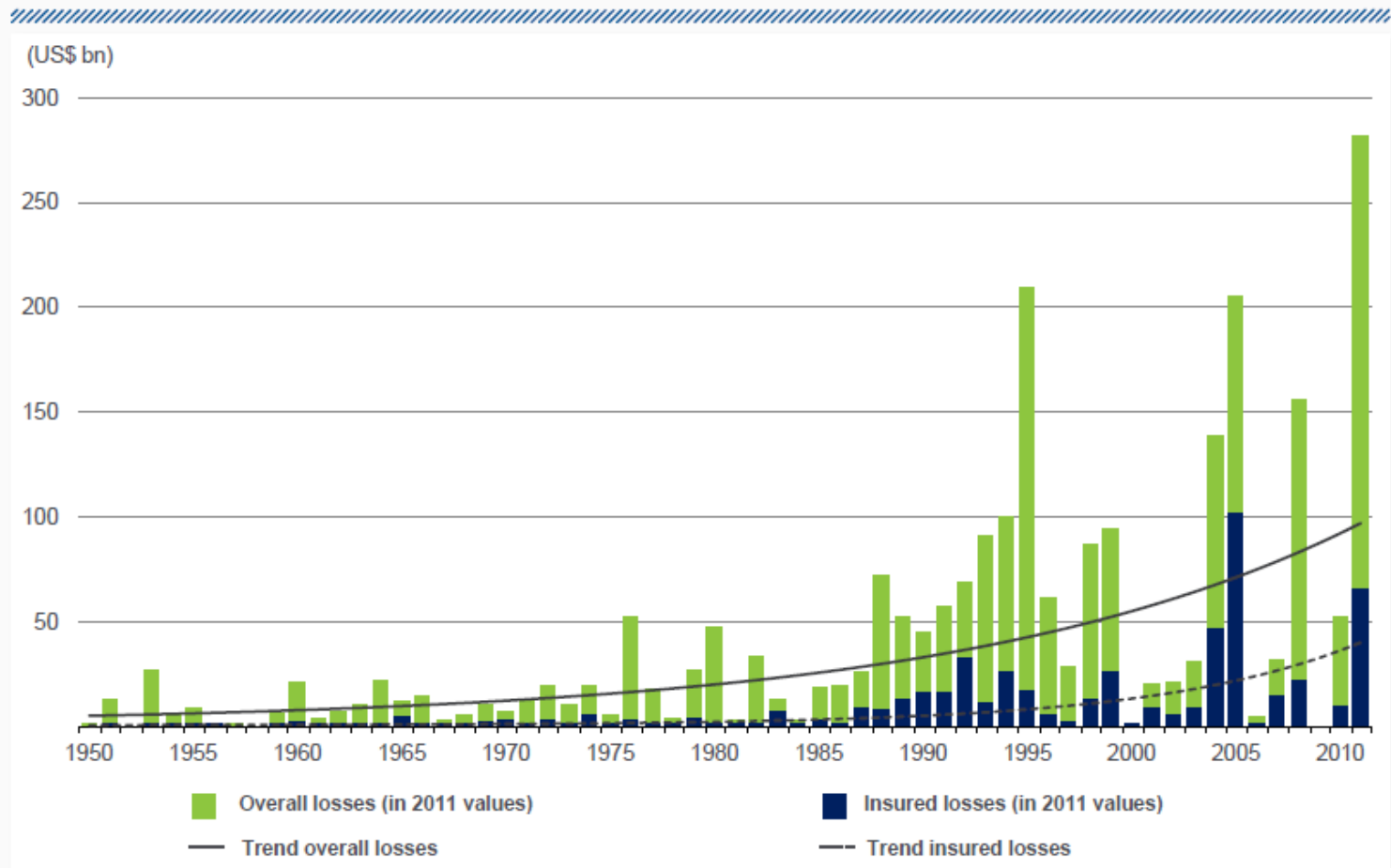
Risk Assessment – Why it matters?

NatCatSERVICE

Great natural catastrophes worldwide 1950 – 2011

Overall and insured losses with trend

Munich RE 



A&B – Natural Disasters

Disaster	Date	Damage (000 US\$)
Hurricane Luis Category 4	5-Sep-1995, Direct hit	350,000
Hurricane Georges Category 3	20-Sep-1998 Direct Hit	100,000
Hurricane Hugo	17-Sep-1989	80,000
Hurricane Earl	29-Aug-2010	12,600
Hurricane Baker/Hurricane Dog	August/Sep 1950 Storm Surge of 2.4 m Wind gust 144mph	1,000

Top 10 Natural Disasters in Antigua and Barbuda for the period 1900 to 2014 sorted by numbers of total affected people:		
Disaster	Date	No Total Affected
Drought	Nov-1983	75,000
Storm	15-Oct-2008	25,800
Storm	17-Sep-1989	8,030
Storm	29-Aug-2010	5,000
Storm	5-Sep-1995	3,702
Storm	17-Nov-1999	3,423
Storm	20-Oct-1999	2,534
Storm	20-Sep-1998	2,025

Source: EM DAT

Existing Spatial Data Situation in the Caribbean

- Not enough data to carry out analysis
- Existing data not readily available
- Numerous data format
- Poor or questionable data quality
- Scale of the data not sufficient
- Metadata non-existent or scant
- Data Vintage
- Data not in digital format or not in raw machine readable format

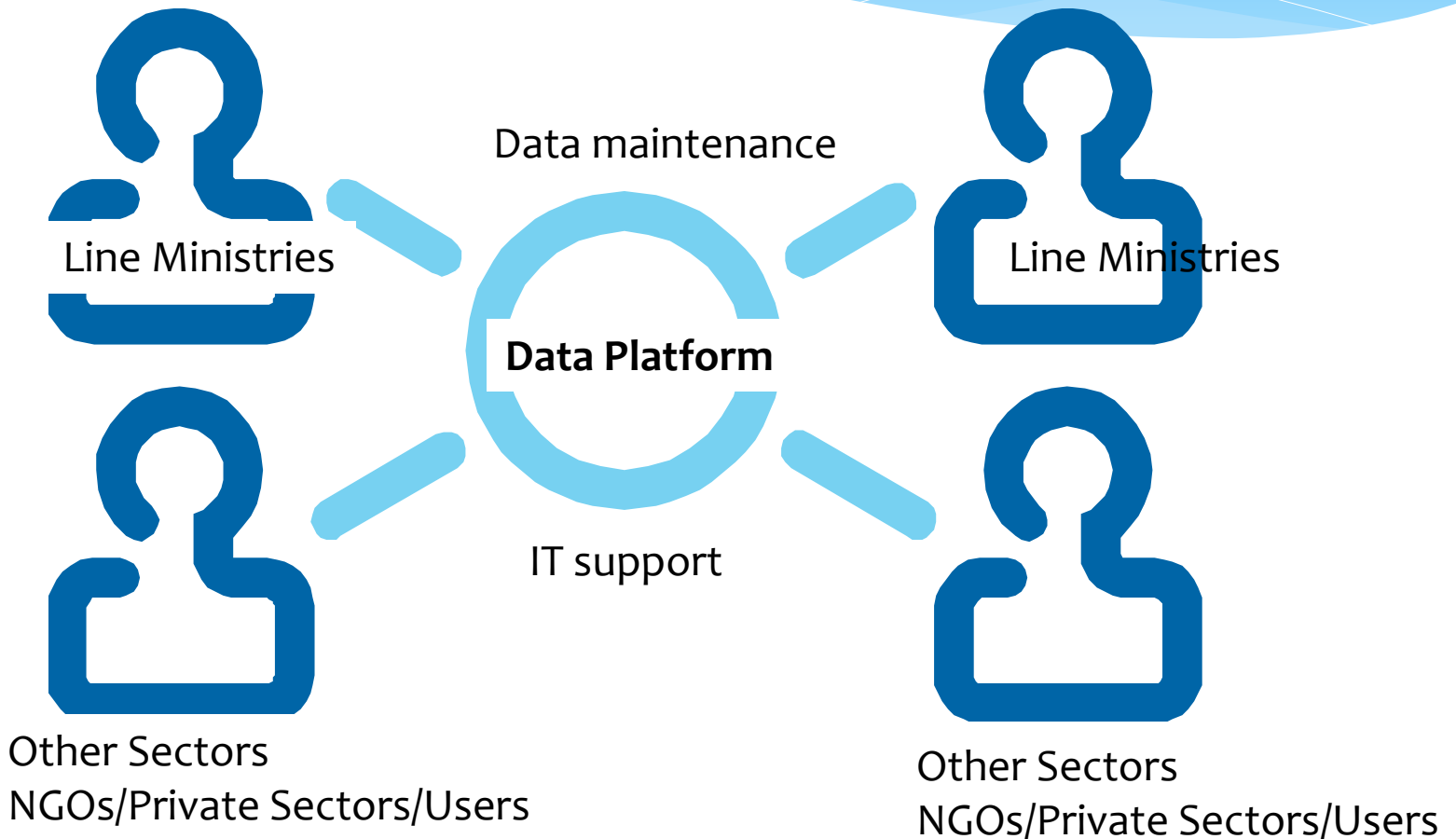
No comprehensive
Data Sharing
mechanism

whether they have anything, up. They arms over data a location of

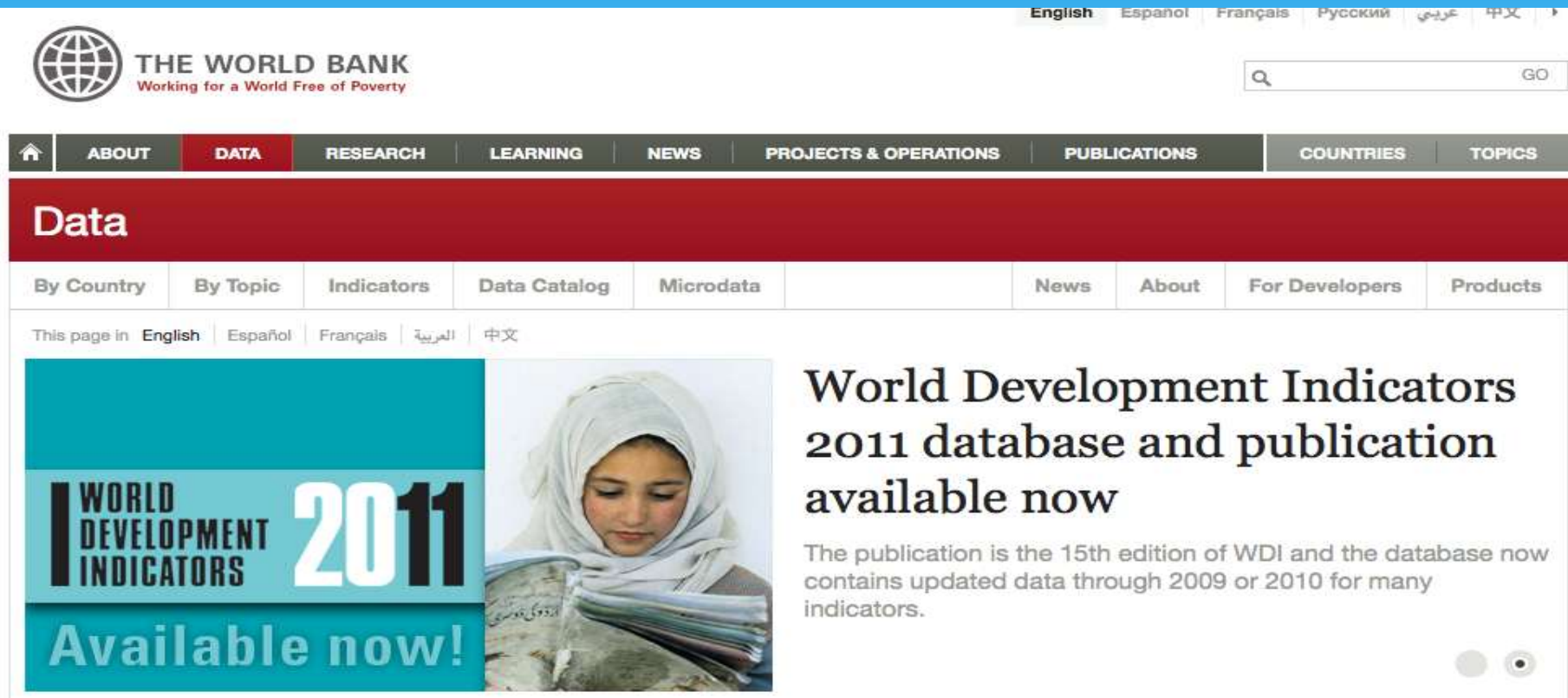
Collaboration Framework

Data Provider

End Users



Open Data & the World Bank



The screenshot shows the World Bank's 'Data' section. At the top, the World Bank logo and tagline 'Working for a World Free of Poverty' are visible. Below the logo is a search bar and a navigation menu with links: ABOUT, DATA (highlighted), RESEARCH, LEARNING, NEWS, PROJECTS & OPERATIONS, PUBLICATIONS, COUNTRIES, and TOPICS. The 'Data' section has a red header with the word 'Data' in white. Below this header is a navigation bar with links: By Country, By Topic, Indicators, Data Catalog, Microdata, News, About, For Developers, and Products. The main content area features a large banner for the 'World Development Indicators 2011 database and publication available now'. The banner includes a teal box with the text 'WORLD DEVELOPMENT INDICATORS 2011 Available now!' and a photograph of a young girl wearing a white headscarf and reading a book. To the right of the photograph, the text reads: 'World Development Indicators 2011 database and publication available now'. Below this, a paragraph states: 'The publication is the 15th edition of WDI and the database now contains updated data through 2009 or 2010 for many indicators.'

English Español Français Русский عربي 中文

THE WORLD BANK
Working for a World Free of Poverty

GO

ABOUT DATA RESEARCH LEARNING NEWS PROJECTS & OPERATIONS PUBLICATIONS COUNTRIES TOPICS

Data

By Country By Topic Indicators Data Catalog Microdata News About For Developers Products

This page in English Español Français العربية 中文

WORLD DEVELOPMENT INDICATORS 2011
Available now!

World Development Indicators 2011 database and publication available now

The publication is the 15th edition of WDI and the database now contains updated data through 2009 or 2010 for many indicators.

The World Bank recognizes that transparency and accountability are essential to the development process and central to achieving the Bank's mission to alleviate poverty. As a knowledge institution, the World Bank's first step is to share its knowledge freely and openly.

Advances in Antigua and Barbuda

- * Open Data readiness Assessment



THE WORLD BANK

Working for a World
Free of Poverty

OPEN DATA READINESS ASSESSMENT

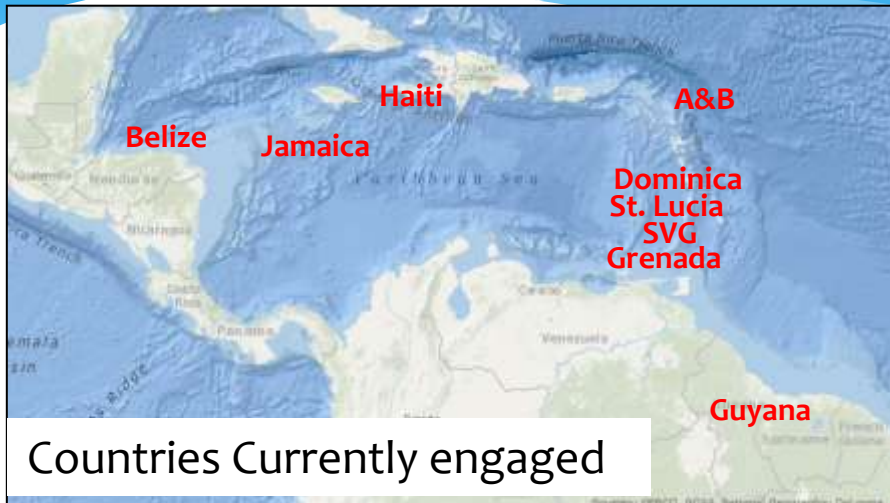
Prepared for
Government of Antigua and Barbuda

June 2013

Open Data for Resilience Initiative (OpenDRI)

The Open Data for Resilience Initiative (OpenDRI) is a global partnership that aims to encourage and facilitate the sharing and use of climate, disaster and other geospatial data to enable more effective decision-making by providing the rationale, technical assistance, and tools for data sharing.

Caribbean OpenDRI



Haiti	www.haitidata.org
St. Lucia	http://sling.gosl.gov.lc/
SVG	http://geonode.gov.vc/
Dominica	www.dominode.net
Grenada	Intranet version only
Belize	http://geoserver.bnsdi.gov.bz/
Jamaica	http://cariska.mona.uwi.edu/
Guyana	http://www.geoserver.ggmc.gov.gy/
Antigua and Barbuda	http://geonode.data.gov.ag

Current Activities to promote OpenDRI

- Institutional Support
- Technical Support
- Innovation
- Capacity Building
- Knowledge Exchange
- Partnership



One of the largest community of practitioners with over 150 active community members

Six Pillars of OpenDRI



Institutional Support

Technical Support

Innovation

Capacity Building

**Knowledge
Exchange**

Partnership

Capacity Building

Two regional workshops have been conducted on data management practices in the Caribbean.

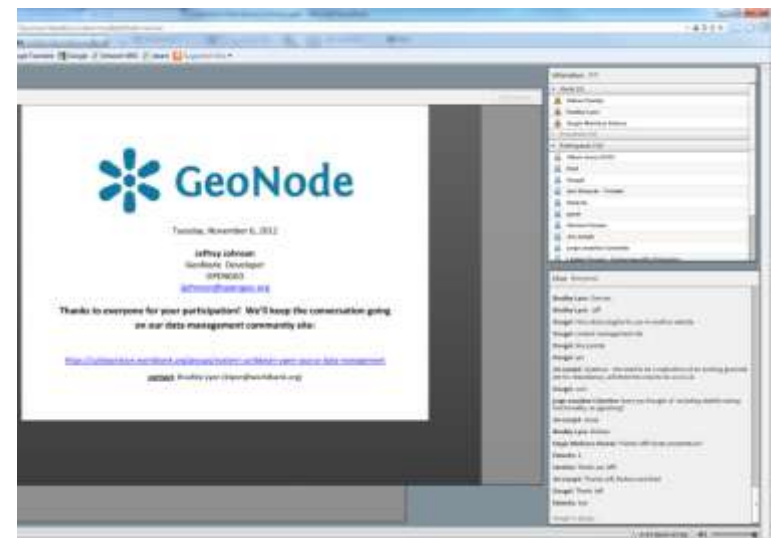
Training/Workshop	Date	Location
Spatial Data Management Training	January, 2013	Belize
Advanced Training on spatial data management	Feb. 18-23, 2013	UWI - Trinidad
DVRP Data Management Workshop	Fall 2013	SVG
Workshop on Conservancy Adaptation Project	March 2014	Guyana
Caribbean Risk Information Program – Kickoff	Spring 2014	TBD

Knowledge management and exchange

Strong community of practitioners - about 80 active participants

Monthly Webinar

Continuous engagement with community of practitioners



Partnership

- * Partnership with local entities
- * The Nature Conservancy
- * Caribbean Community Climate Change Center
- * University of West Indies
- * USAID (RRACC)
- * Georgia Tech CHAMP
- * The World Bank – other sectors

OpenDRI Emerging Technologies

Tools

GeoNode - Collaborative data sharing

InaSAFE - Deterministic risk assessment

CAPRA - Probabilistic risk assessment

QGIS – Open Source Desktop GIS

OSM - Participatory mapping

Open Data Tool Kit – Mobile data collection

Spatial Data Infrastructure (SDI)

Adapted from GeoNode training previously conducted

SDI goals

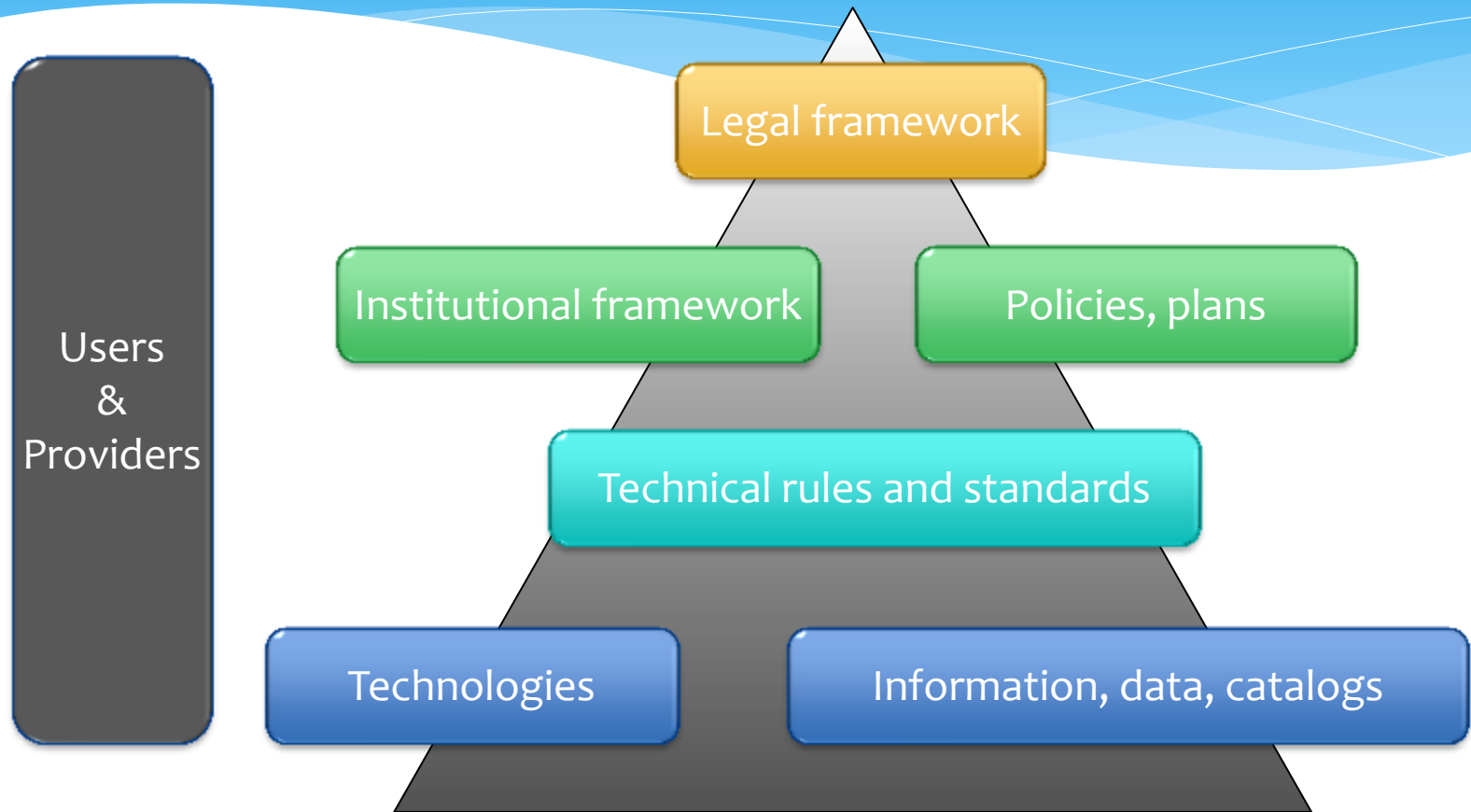
- * Fulfill the basic rights regarding **access** to information generated by public institutions, for governmental and private entities as well as the general public
- * Provide better visibility and **transparency** to the actions and projects of the public and private institutions, offering the public useful information and participation tools
- * **Integrate** geographical information on a common cartographic base, complete and updated
- * **Coordinate** information production, access and use, to improve efficiency and interoperability, both horizontally and vertically
- * Support the coordination of **multi-disciplinary activities** like strategic planning, land planning, risk management, resource management...
- * Support the economic and social **development**, reducing costs for companies and professionals to access information and therefore allow them to create added-value products and services

Brief history

- * FGDC: Created in USA by National Executive Order (1994)
- * Open Geospatial Consortium created from OpenGIS project (1994)
- * ISO/TC211 formed (1994): WMS (2000), WFS (2002), GML Simple Features (2006) standards released
- * National SDI consolidation in USA, Europe, Australia. EU INSPIRE Directive (2007)
- * Thematic and national SDIs advancing in other regions



Components of a SDI



Components of a SDI

- The **legal and institutional framework** is essential to the sustainability of an SDI:
- Defining *competences and responsibilities* for information production, maintenance and distribution
- Defining *policies* regarding information access and use
- Creating reasonable *rules and standards* for interoperability, and promote their adoption
- *Planning* of coordinated needs and solutions
- Optimizing *resources* by means of joint projects

Key Elements for a National SDI

- * National Policy for Geoinformation
 - * Access, use, distribution
 - * Allow modulation for different thematic areas
- * National Cartography Plan
 - * Define fundamental and thematic datasets
 - * Define responsibilities for sectors/thematic areas
 - * Define mechanisms for funding, shared responsibility
- * SDI Implementation Plan
 - * Must consider all SDI components
 - * Phase 1: Base legislation, data production investments. Visible prototypes
 - * Phase 2. Technological development and institutional development
 - * Human resources intensive (training, metadata, publishing)
 - * Investment towards technological platform and institutional capabilities
 - * Phase 3. Maintenance and update
 - * Coordinated procedures and funding for data maintenance
 - * Metadata update, scalability of services

Funding options

- * Essential shared datasets should be assumed as a **public asset** and funding provided by the State
 - * E.g. The National Plan or Aerial Ortho-photography in Spain
- * Under the co-responsibility policy, **each institution** must provide funding for the data assigned by the National Plan
 - * Free Web access, at least for map-image view
 - * Cost recovery for non-commercial downloads, physical copies
 - * Data sales and exploitation agreements for commercial uses
 - * Added-value products and services
- * **International** cooperation funds
 - * Inter-institutional R&D (to develop technological platform)
 - * Generation of base datasets (orthophotos, cadaster, base cartography) to regularize land property, support infrastructure development
 - * Multi-national priority areas: climate change, disaster risk management
 - * Institutional and governance strengthening
- * **Coordination with e-Government programs**
 - * Implementation of public services (certifications, permits...)
 - * Develop network connectivity and other technological components
 - * Improve institutional capabilities, especially at local government level

Key benefits

- Better information management **within country**
 - Avoid information *loss, duplications and inconsistencies* leading to inefficiencies, mistakes and even legal problems (a 30% cost save reported after metadata/catalog creation)
 - Better internal *control* on information responsibility, access and use
 - Reduce information *acquisition and distribution costs*. Resources are released to be used to advance the organization's true mandate
 - Improvement in *planning and tracking of projects*, by using geospatial statistics and indicators

Key benefits

- * Improved coordination between institutions
 - * Develop common strategic and operative planning (e.g. for disaster risk mitigation)
 - * Have a common framework for following up & reporting on interventions (e.g. public works impact)
 - * Consultation on proposed development projects (e.g. common discussion and advance warning on public infrastructures)
 - * Joint data acquisition and updates
 - * License and permit processing and verification (avoid multiple requests, inconsistent permits...)

Key benefits

- Provide information **integration** mechanisms for interdisciplinary sectors.
 - Environmental management: water, soil, air, waste, biodiversity, climate
 - Social services: health, education, culture, public transportation
 - Development: public works, tourism & transportation, commerce, industry
 - Risk management: safety, public events, disaster prevention and relief

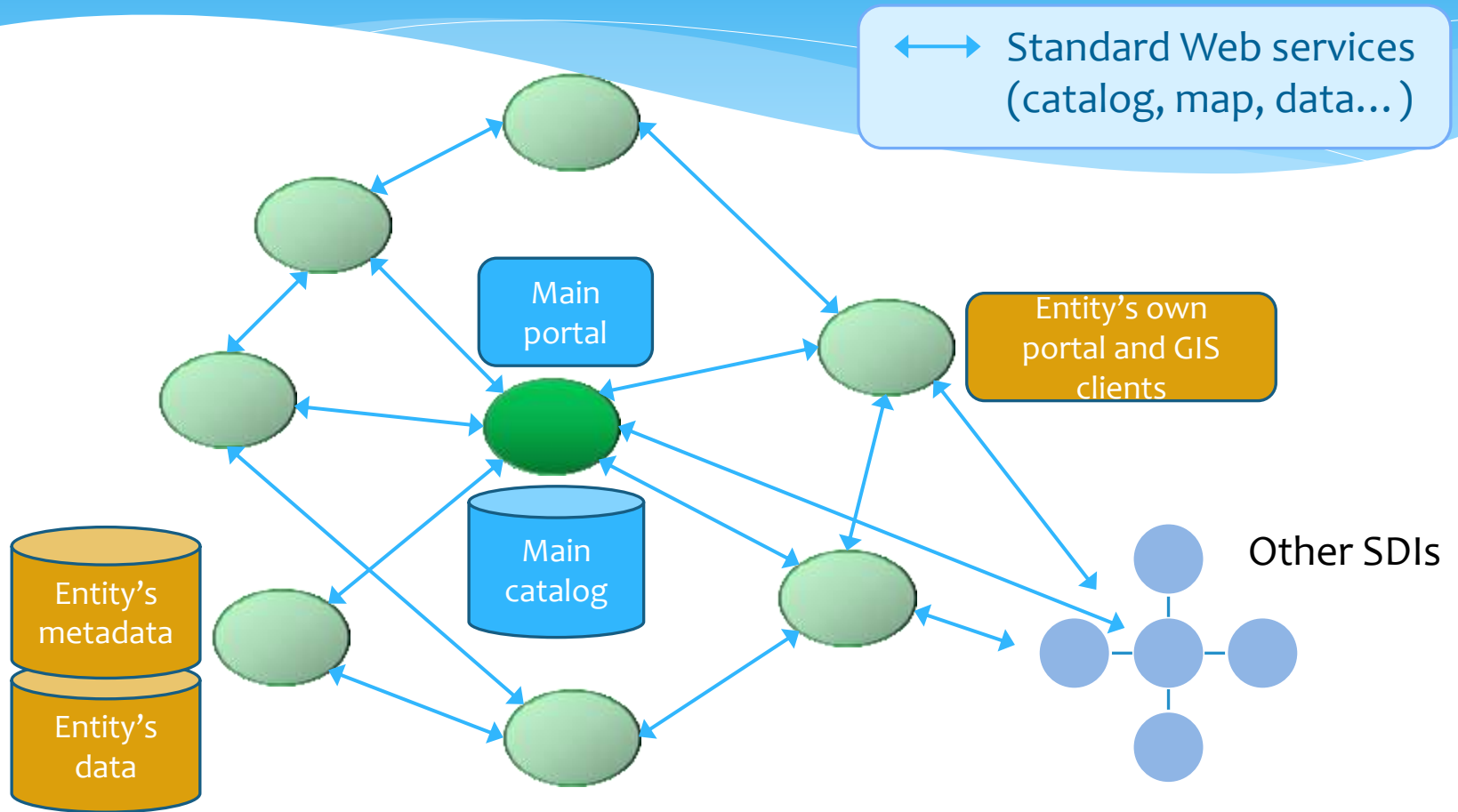
Key benefits

- Economic **development**: access of government and private sector to information is a key factor
 - *Cost reduction* for private activity, better planning and marketing (e.g. geomarketing, logistics...)
 - Creation of *added-value services and products* (e.g. smartphone apps based on location)
 - Reduced cost, better quality and reliability in *return of information to government* (e.g. web license request based on updated map information).

Technological structure

- * The 'standard' SDI is made of distributed nodes
 - * Each participant entity
 - * Publishes standard services to provide access to its information
 - * Catalogs these services with metadata
 - * As a user, it can access metadata and services from other nodes
 - * Common resources
 - * The SDI catalog collects all metadata and provides search service
 - * The SDI portal offers search, query, download and visualization

Technological structure



Relationship between SDIs

- * Thematic SDIs

Participants share a common thematic interest (biodiversity, disaster management, land use and planning, geosciences...)

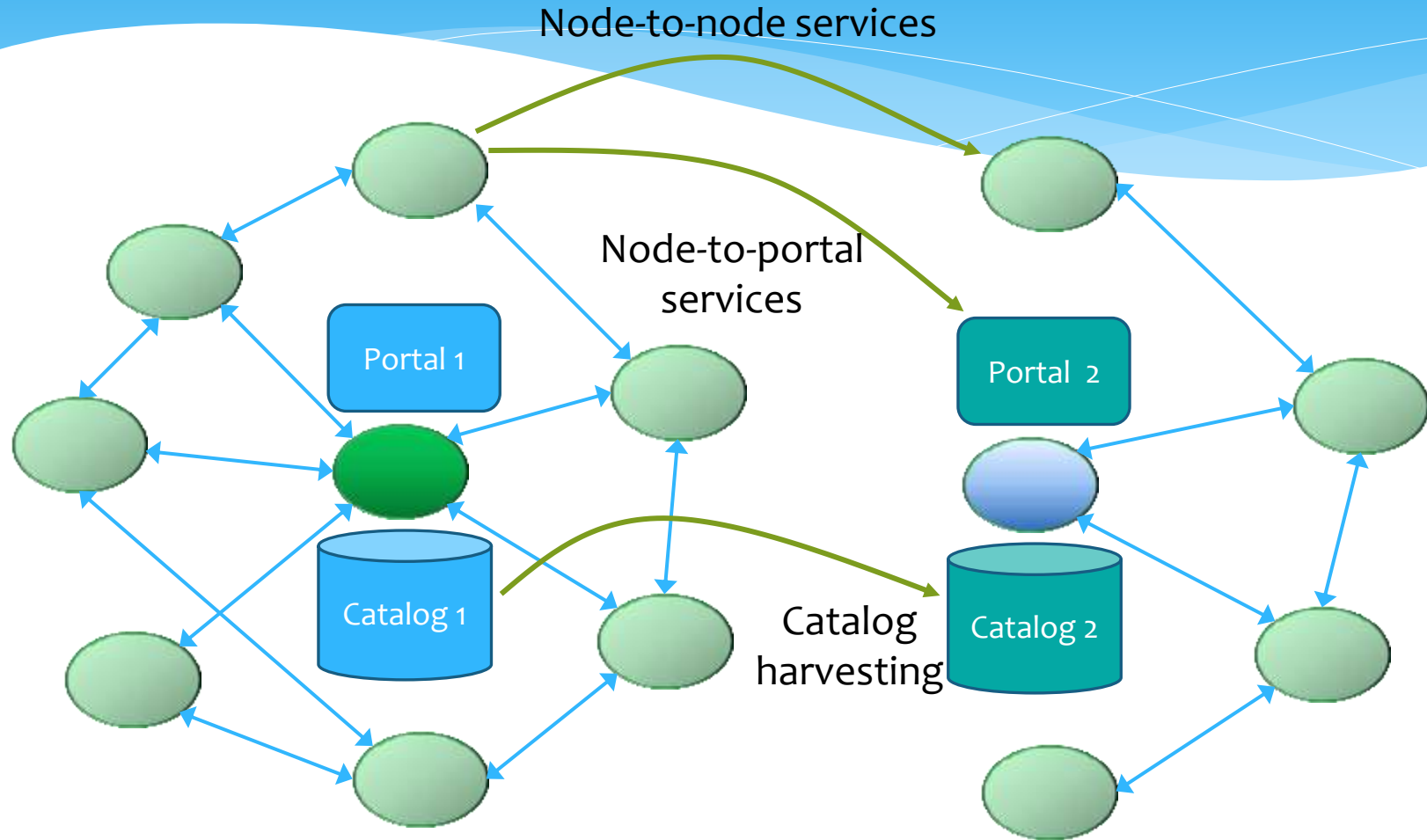
- * Hierarchical SDIs

Defined at different levels (multinational, national, regional, municipalities). Each level aggregates the lower ones

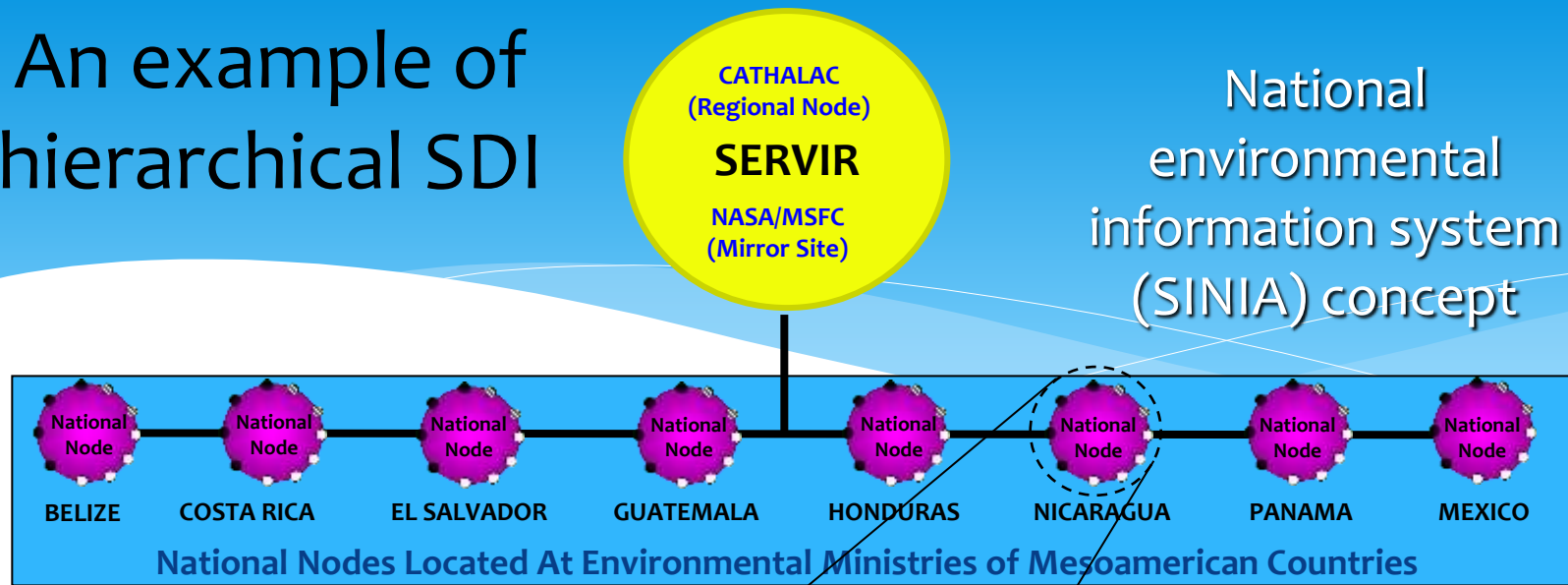
- * SDI Federation

Because of the distributed interoperability and access, SDIs can merge, reusing, composing and adding value on services and metadata. **SDIs don't have boundaries.**

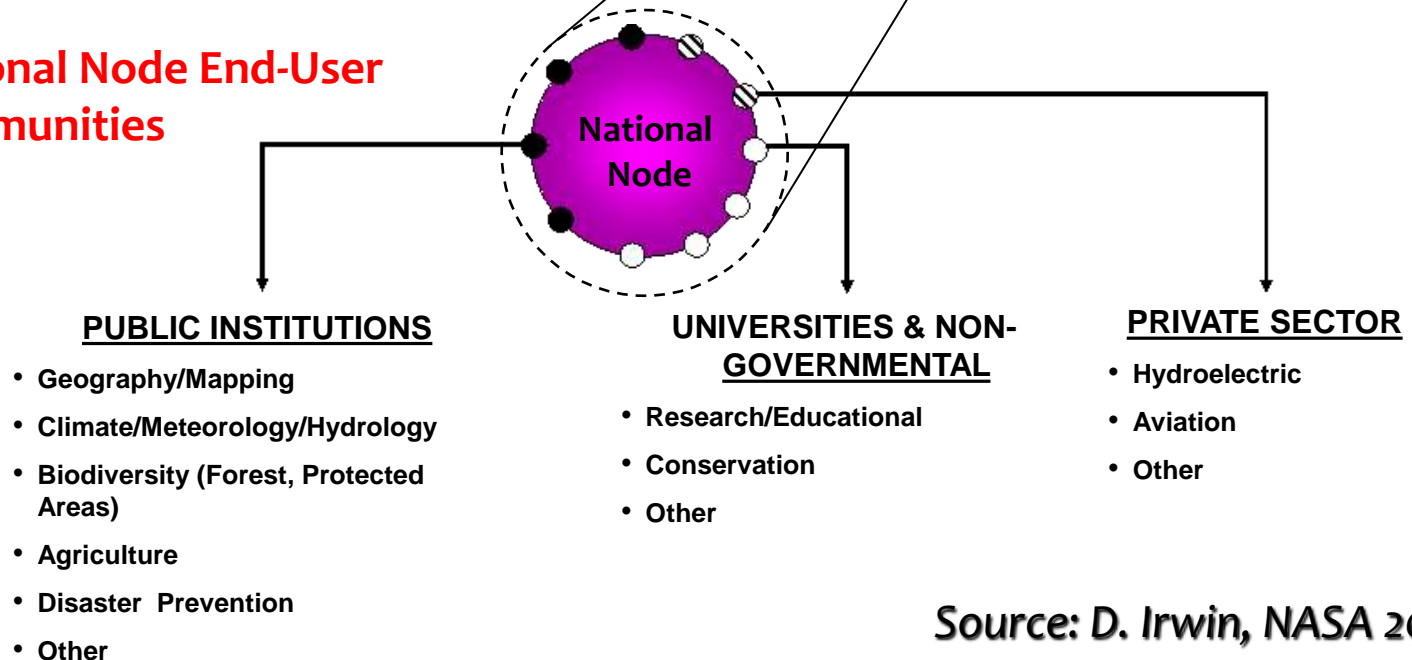
Relationship between SDIs



An example of hierarchical SDI



National Node End-User Communities



Source: D. Irwin, NASA 2005

<https://www.servirglobal.net/Mesoamerica.aspx>



buscar...

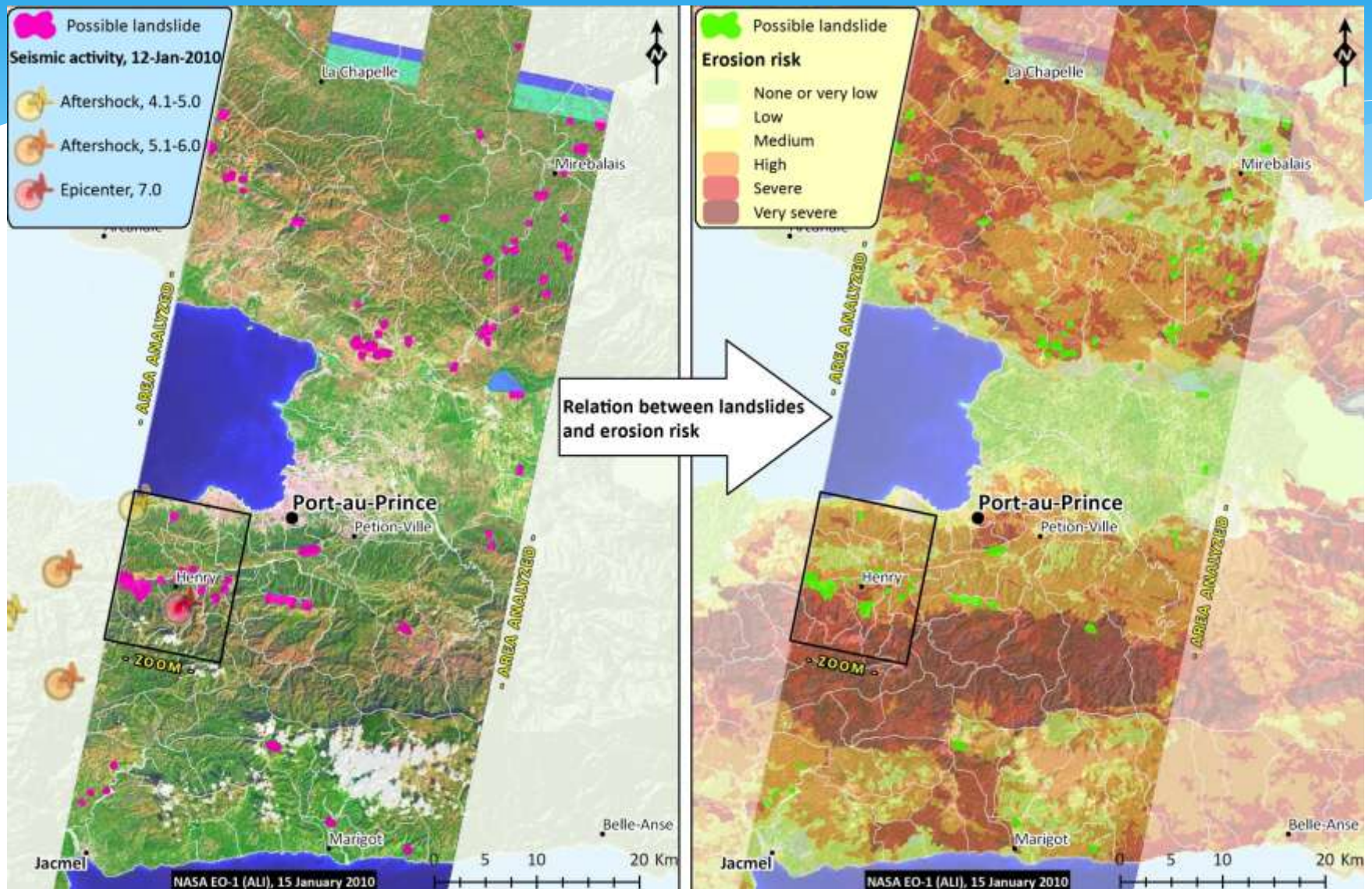
Español ▼

INICIO NOTICIAS SERVIR BLOG PORTAL DE DATOS CALIDAD DEL AIRE VISUALIZACIONES 3D COLABORADORES GALERÍA DE IMÁGENES ACERCA DE SERVIR

- Downloadable data
- Online mapping & animation applications
- Decision support tools
- 3D visualization tools

SERVIR.NET
30 SEP 08 – 09:45:00 UTC

Locating Landslide Risks in Post-Quake Haiti



SDI and Disaster Risk Management

- * The evaluation of threats and vulnerabilities requires spatial information analysis
- * Risk management is multi-discipline, multi-institutional and multi-level. It does not understand of political boundaries
- * The need for interoperability and integration makes it difficult to cross institutional and technical barriers
- * Projects to provide access to global data (satellite imagery and other sensor data) have been advancing, but there is little progress in other systems

SDI and Disaster Risk Management

Global programs



THE GLOBAL EARTH OBSERVATION
SYSTEM OF SYSTEMS



Global Earth Observation System of Systems (GEOSS)



SDI and Disaster Risk Management

Global programs

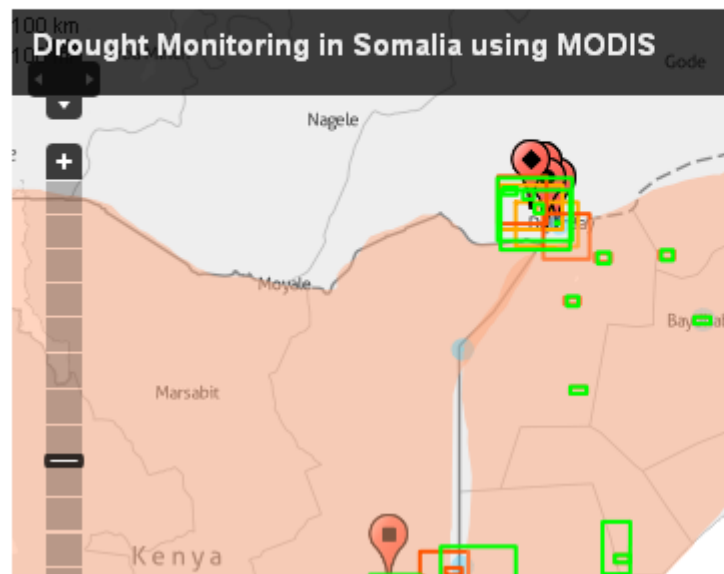


UNITED NATIONS | UNOOSA | UN-SPIDER

*United Nations Platform for Space-based Information for
Disaster Management and Emergency Response*

HORN OF AFRICA FAMINE SATELLITE INFORMATION OVERVIEW

Click on the individual layers to view any additional information. The KML file of this page.



SATELLITE INFORMATION REQUESTS, ACQUISITIONS AND PRODUCTS

User Requests

These will be updated on an ongoing basis

- ☒ Areas of Interest-AOIs (sourced 28.07.2011, UNOCHA)
- ☒ SAFER User Requests (sourced 29.07.2011, WFP)

Satellites Tasked/Acquisitions

These will be updated on an ongoing basis

- ☒ SAFER Acquisitions (sourced 29.07.2011, WFP)

Mapping Products

These will be updated on an ongoing basis

- ☒ Refugee Camp Map - Detail - Ethiopia - Buramino (sourced 29 July 2011, DLR)
- ☒ Crop Growth Monitoring with MODIS in the north part of Sudan (sourced 11 July 2011, NDRCC)
- ☒ Drought Monitoring with HJ-1 in the north of Sudan (sourced 19 July 2011, NDRCC)
- ☒ Overview Map of Refugee Camps in Dadaab, Garissa, N.Eastern, Kenya (sourced 1 August 2011, NDRCC)

SDI and Disaster Risk Management

Global programs

The screenshot displays the EMERGENCY RESPONSE SERVICE Gmes website. The header features the Gmes logo, which includes a stylized orange triangle with a white circle and two human figures, followed by the text "EMERGENCY RESPONSE SERVICE Gmes" and "powered by safer". To the right of the header is a large orange map of the world with a white circular crosshair. Below the header, there is a search bar with the text "search" and "ok", and a button labeled "Open the movie". On the left side, there are four blue buttons with white text: "The Gmes Emergency Response Service", "How to access the Service", "Preparing the Future", and "Latest news". Below these buttons is a text block that reads "An European Space-based mapping service to support crisis management". The main content area shows a satellite map of Europe and Africa with several red and white location markers. Above the map, there are two dropdown menus: "... all countries" and "... the last 20 events except Hot Spot". To the right of the map, there is a button labeled "enlarge the map" and a dropdown menu labeled "Satélite".

EMERGENCY RESPONSE SERVICE Gmes
powered by safer

search ok

Open the movie

The Gmes Emergency Response Service

How to access the Service

Preparing the Future

Latest news

An European Space-based mapping service to support crisis management

... all countries

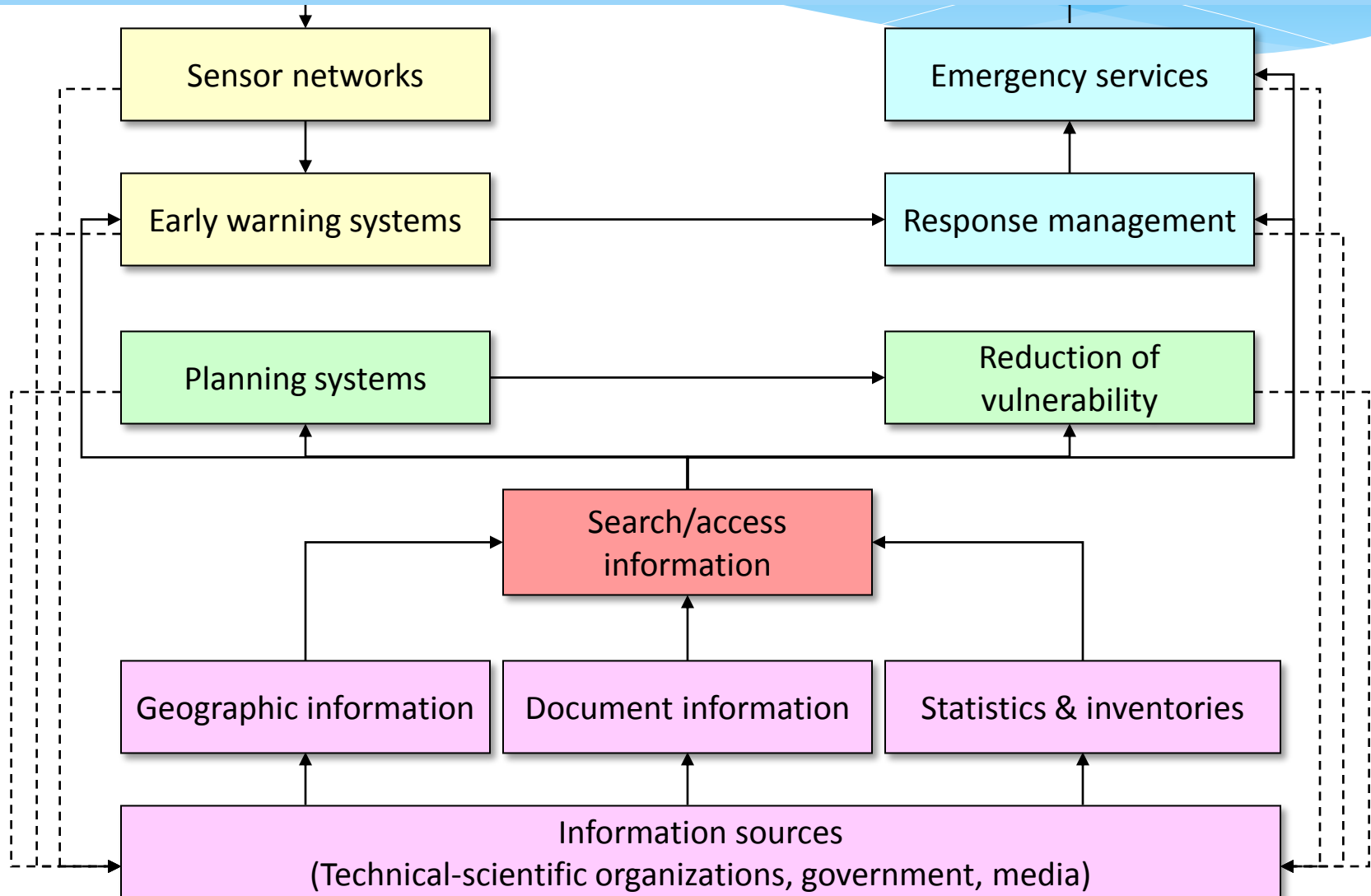
... the last 20 events except Hot Spot

enlarge the map

Satélite

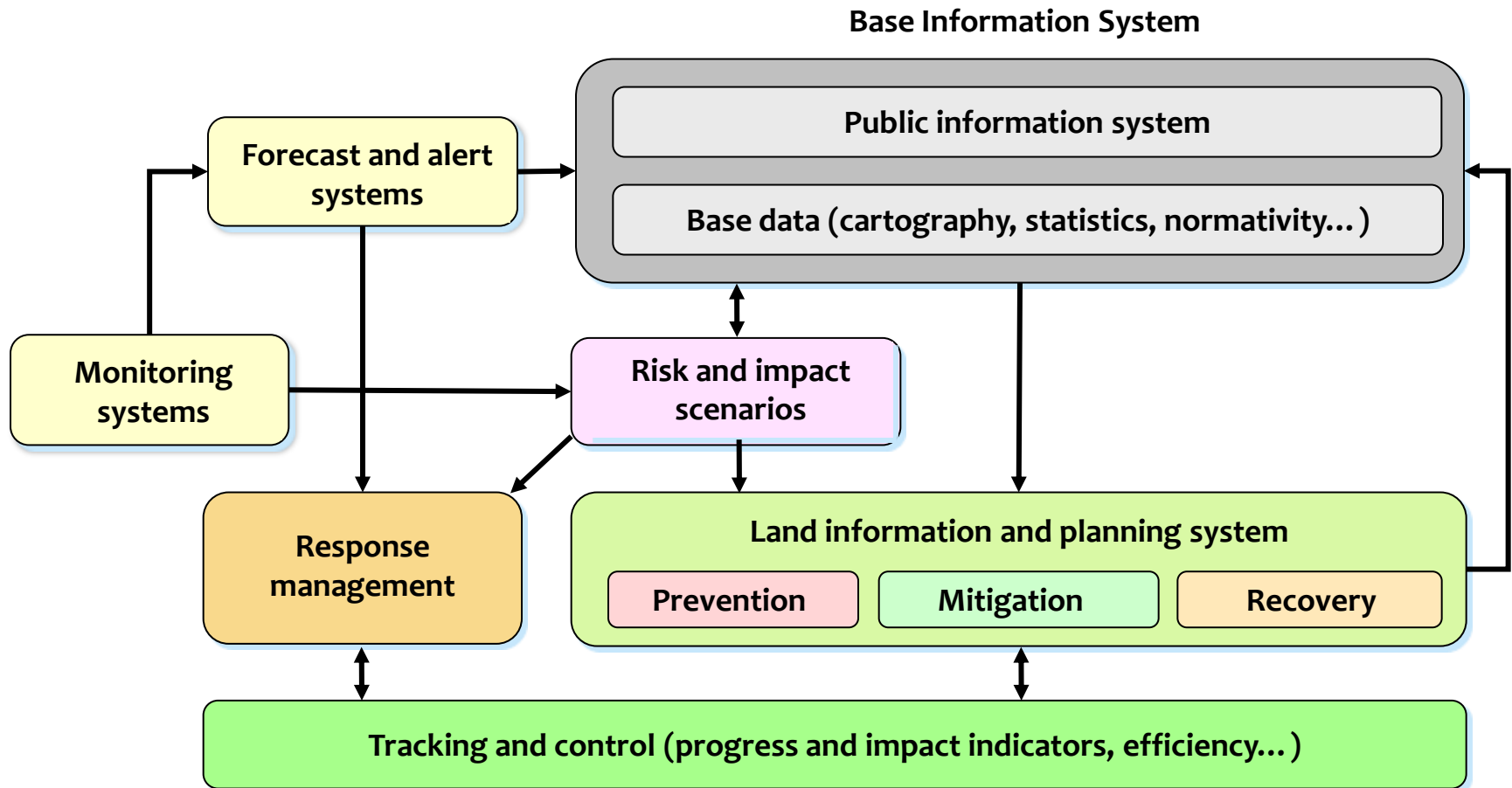
SDI and DRM

Data flow



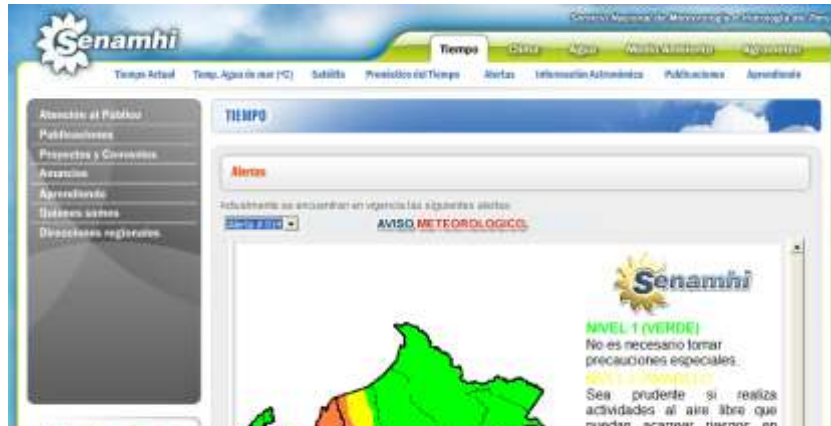
SDI and DRM

An ideal system of systems

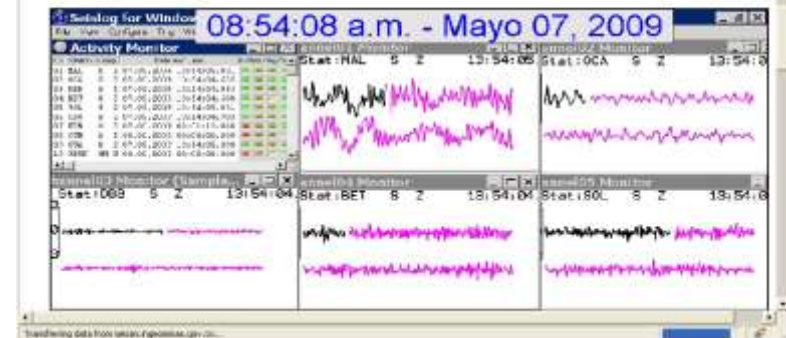


SDI and DRM

Monitoring, forecast and alert



<div></div> <div>SERVICIO NACIONAL DE METEOROLOGÍA E HIDROLOGÍA UNIDAD DE PRONÓSTICOS</div> <div></div>					
PRONÓSTICO POR CAPITALES			Hoy es: 10-Mayo-2009		
Cajalilla Cochabamba El Alto La Paz Oruro Potosí Santa Cruz Sucre Tarija Trinidad Pronóstico					
Ciudad: La Paz					
Pronóstico para Hoy : Domingo 10-Mayo-2009					
Máxima pronosticada	Mínima pronosticada	Viento	Mañana	Tarde	Noche
20.0 °C	5.0 °C	SUDESTE 12 Km/h			
Última actualización 2009-05-10 12:07:12			Poco Nuboso	Chubasco	Poco nuboso
Pronóstico para el : Lunes 11-Mayo-2009					
Máxima Pronosticada	Mínima Pronosticada	Viento	Mañana	Tarde	Noche
18.0 °C	4.0 °C	CALMOS POR LA MAÑANA Y SUDESTE POR LA TARDE 12 Km/h			
Última actualización 2009-05-10 12:05:03			Nuboso	Chubasco	Nuboso
Pronóstico para el : Martes 12-Mayo-2009					
Máxima Pronosticada	Mínima Pronosticada	Viento	Mañana	Tarde	Noche
20.0 °C	5.0 °C	SUDESTE 12 Km/h			
Última actualización 2009-05-10 12:04:14			Poco Nuboso	Chubasco	Poco nuboso



SDI and DRM

Response management

INDEC

EVALUACIÓN DE DAÑOS Y ANÁLISIS DE NECESIDADES

REGISTRO DE DAÑOS

Emergencia Activada:
EXERCIT - FUNDACION EN LAS AL COMEN EN LA PROVINCIA DE PUERTO RICO DE LUYAL

Departamento: Pinar del Rio Provincia: Pinar del Rio Municipio: Pinar del Rio

Localidad: SAN JOSE

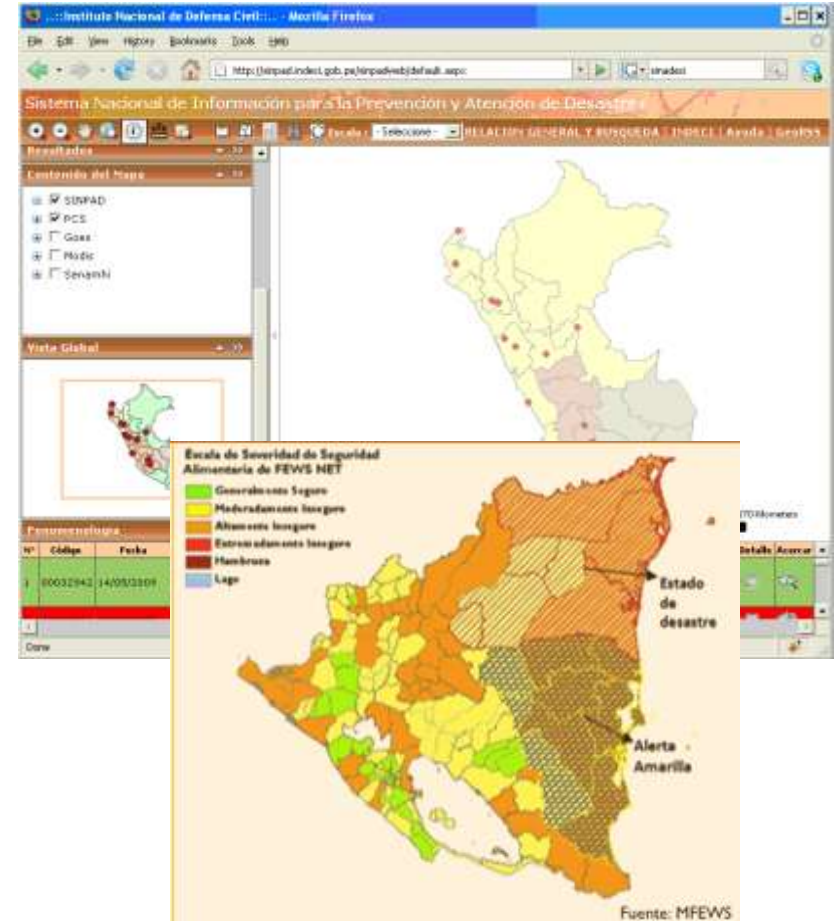
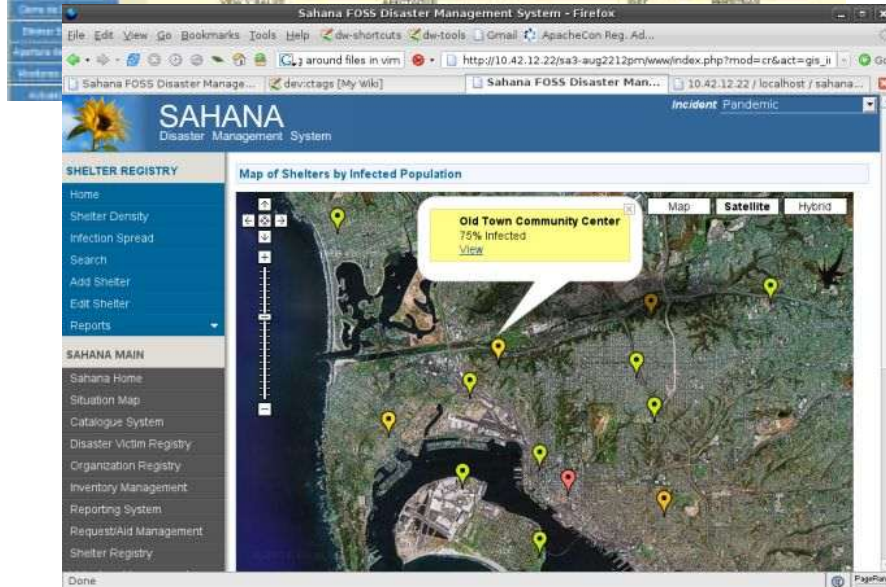
Evaluación de Daños:

Tipo de Daño: Daño Cantidad

VER y BALLE: afectados 3507

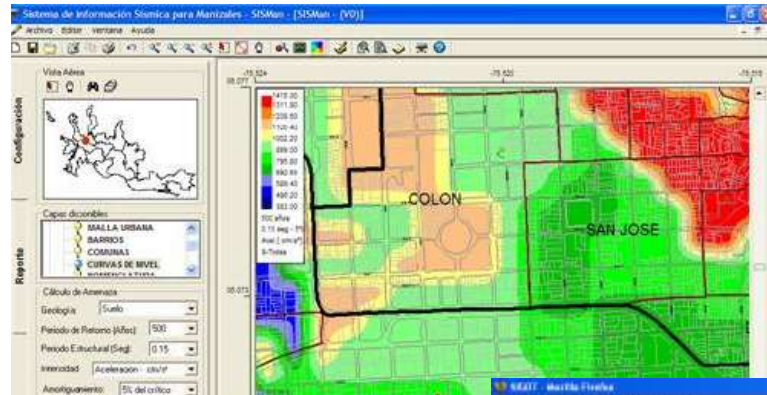
Orden

DAÑOS POR LOCALIDAD			
TIPO DE DAÑO	PERSONAS AFECTADAS	CANTIDAD	UNIDAD
VEDA Y SALIDA	AFECTADOS	3507	PERSONAS
VIVIENDAS Y LOCALES PUBLICOS	VIVIENDAS Y LOCALES AFECTADAS	406	UNIDAD
DAÑOS TOTAL POR LA EMERGENCIA			
TIPO DE DAÑO	PERSONAS AFECTADAS	CANTIDAD	UNIDAD
VEDA Y SALIDA	AFECTADOS	3507	PERSONAS



SDI and DRM

Risk assessment, land use planning

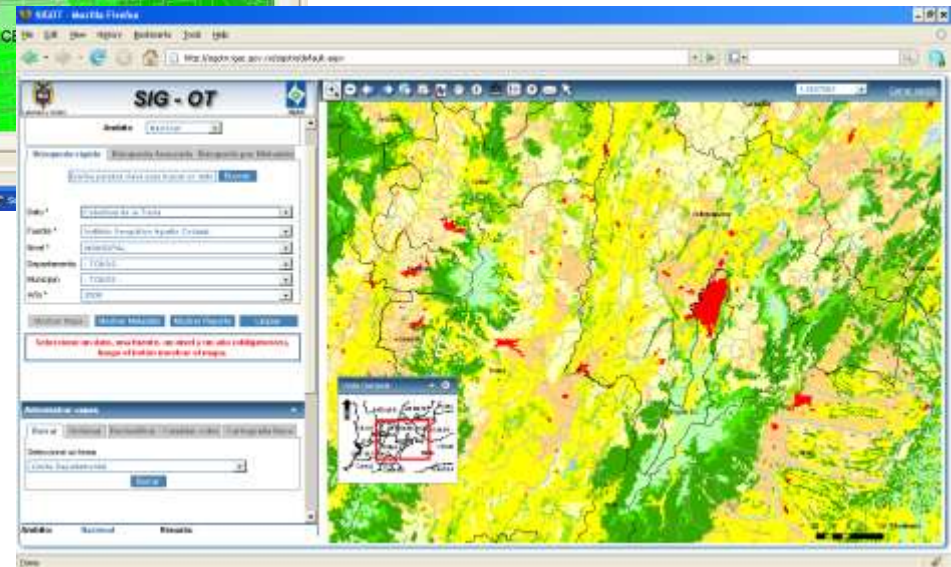
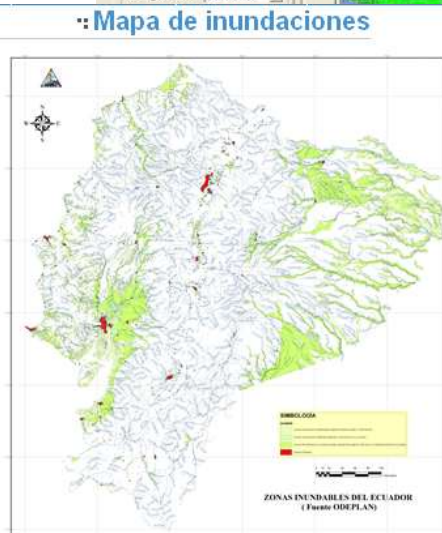


Viernes 8/Mayo/2009

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- [Avisos y Alertas](#)
- [Meteorología](#)
- [Hidrología](#)
- [Red de Estaciones Hidrometeorológicas](#)
- [Mapas](#)
- [Información Hidrometeorológica](#)
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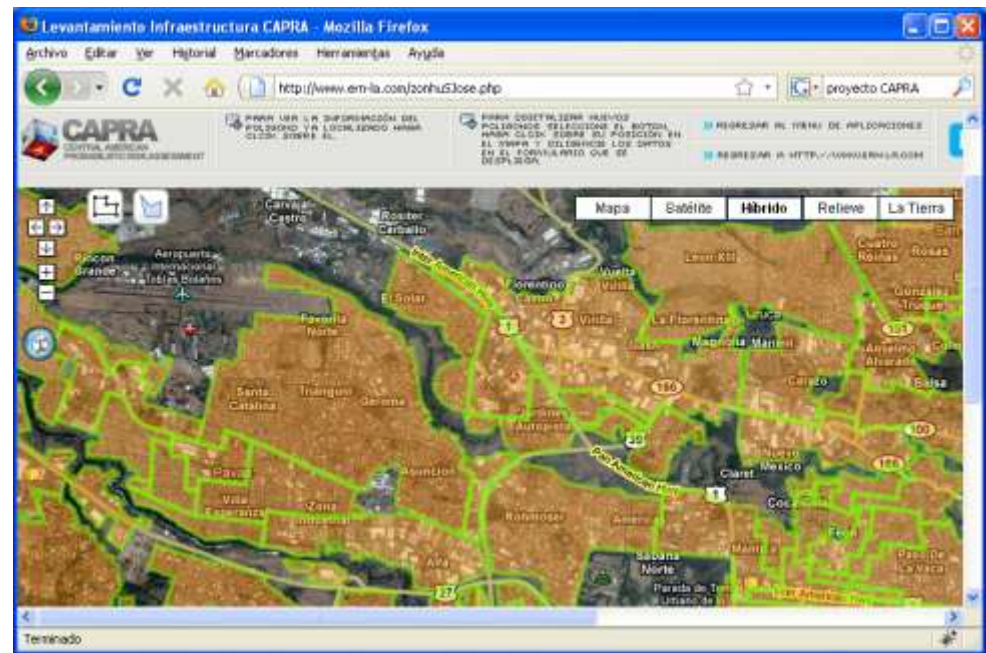
Correo Electrónico



SDI and DRM

Scenario analysis systems

- These systems integrate data services from different sources to perform a risk analysis, evaluating the possible event impacts
- Remote processing Web services (WPS) allow to access distributed analysis processes, so many organizations can access not only data but also intelligent analysis



SDI and risk management

Scenario analysis systems

- **Central American Probabilistic Risk Assessment (CAPRA)**. This project provides data, software and financial support for risk assessment projects www.ecapra.org
- They have started using **GeoNode**



The image is a screenshot of the CAPRA website. At the top left is the CAPRA logo, which consists of three interlocking cubes in green, yellow, and blue, followed by the text "CAPRA Probabilistic Risk Assessment Initiative". To the right of the logo is a navigation menu with links: HOME / ABOUT CAPRA / LATIN AMERICA - TAPS / SOUTH ASIA / SOFTWARE / COMMUNITY / LIBRARY / CONTACT / SIGN IN. Below the navigation menu is a paragraph of text: "CAPRA is a Disaster Risk Information Platform for use in decision-making that is based on a unified methodology and tools for evaluating and expressing disaster risk; Building on—and strengthening—existing initiatives, CAPRA was developed by experts to consolidate hazard and risk assessment methodologies and raise risk management awareness." In the top right corner, there are links for "English" and "Español". Below the main content area, there is a blue horizontal bar. Underneath this bar, there are three main initiatives listed: "MAIN INITIATIVES", "TECHNICAL ASSISTANCE PROJECTS (TAPs)", "SOFTWARE DEVELOPMENT", and "GEONODE". Each initiative has a corresponding image: a world map for TAPs, a group of people working on laptops for Software Development, and a colorful abstract graphic for GeoNode. The "GEONODE" section is highlighted with a red rectangular border.

English | Español

HOME / ABOUT CAPRA / LATIN AMERICA - TAPS / SOUTH ASIA / SOFTWARE / COMMUNITY / LIBRARY / CONTACT / SIGN IN

CAPRA is a Disaster Risk Information Platform for use in decision-making that is based on a unified methodology and tools for evaluating and expressing disaster risk; Building on—and strengthening—existing initiatives, CAPRA was developed by experts to consolidate hazard and risk assessment methodologies and raise risk management awareness.

MAIN INITIATIVES

TECHNICAL ASSISTANCE PROJECTS (TAPs)

SOFTWARE DEVELOPMENT

GEONODE

SDI and urban land management

- * SDIs are potentially a powerful land management tool:
 - * Integrate different government-administrative levels
 - * Integrate the many organizations involved in planning, use and manage territory and its resources
 - * Municipalities are potentially the ones who have more to gain from a simple and inexpensive access to territory information
 - * The cadastral-property information is the base to manage land at detailed scales (1:1000), in both urban and rural environments
- * But an SDI is not enough if it is not linked to specific local management tools (urbanism, taxes, tourism, agriculture, waste, water...)

SDI and urban land management

■ Generic requirements of municipalities

- Access to base cartography (orthophotos, roads and streets, land use), complete and updated
- Coordinated acquisition of geoinformation and statistics
- Geocoding and georeferencing of records (e.g. a table of shop permits contains an informal address but no precise geolocation)
- Coordination of strategic planning through administrative levels
- Coordination in planning and execution of development plans, interventions and events

SDI and urban land management

The screenshot displays the CartoCiudad web application interface. The top navigation bar includes logos for the Spanish Government, Ministry of Development, Ministry of Economy and Finance, Directorate General of the Cadastre, INE, Correos, and the CartoCiudad logo. Below the navigation bar is a search bar and a menu with options: Buscar, Proximidad, Rutas, and Capas. The main map area shows an aerial view of a city block in Valencia, with various urban land management data overlaid. The data is categorized into WMS CATASTRO, SECCIONES CENSALES, CÓDIGOS POSTALES, CALLEJERO, and FONDO URBANO. The WMS CATASTRO section includes a legend for LÍNEAS (Manzana, Parcela, Construcción) and ATRIBUTOS (Construcciones). The SECCIONES CENSALES section shows the code 07 011. The CÓDIGOS POSTALES section shows the code 28033. The CALLEJERO section shows the street name CALLE BURITICA and the code R-2. The FONDO URBANO section shows the code 36 and the name IGLESIA. The map also features a search bar with the text 'Buscando info' and a zoom control on the right side.

GOBIERNO DE ESPAÑA
MINISTERIO DE FOMENTO
MINISTERIO DE ECONOMÍA Y HACIENDA
DIRECCIÓN GENERAL DEL CATASTRO
INE
CORREOS
CartoCiudad

Buscar Proximidad Rutas Capas

Leyenda

☒ **WMS CATASTRO**

LÍNEAS

- Manzana
- Parcela
- Construcción

ATRIBUTOS

- Construcciones

☐ **SECCIONES CENSALES** 07 011

☐ **CÓDIGOS POSTALES** 28033

☒ **CALLEJERO**

Calles CALLE BURITICA

Carreteras R-2

Aceras

Portales y Pks 36

Topónimos IGLESIA

☒ **FONDO URBANO**

- Manzana
- Zona Deportiva
- Zona Verde
- Hidrografía

Buscando info

SDI and urban land management

Menú principal

- Inicio
- Participantes
- ¿Cómo solicitar LocalGIS?
- Guía de funcionalidad
- Enlaces
- Buscar
- Noticias externas
- Guías Urbanas

Formulario de acceso

Usuario

Clave

☐ Recordarme

Entrar

[¿Recuperar clave?](#)

Sindicación

 2.0

Bienvenid@ a la web del proyecto LocalGIS en la provincia de Valencia

Bienvenidos a la página web de **LocalGIS Provincia de Valencia**, un **Sistema de Información Territorial** para la Administración Local.



Esta herramienta implementa las funcionalidades necesarias para la gestión territorial dentro del ámbito municipal: **Planificación Urbanística, Catastro, Padrón, Actividades Contaminantes, Patrimonio, Infraestructuras, Licencias de Obra, Guía Urbana...**

Para ello combina la tecnología de los **SIG** (Sistemas de Información Geográfica) con funcionalidades administrativas y **servicios Web**.

La Diputación de Valencia ha participado en el **Comite de Dirección y Seguimiento**

Noticias breves



La Diputación implanta el Sistema de Información Territorial LocalGIS en los Ayuntamientos de la provincia

localgis-dos

La Diputación participa en el Comité de Seguimiento de LocalGIS Dos



Lista de Distribución
[Comunidad LocalGIS]

SDI and urban land management



SDI and urban land management

Access to National Cadaster e-Office

Sede Electrónica del Catastro - Mozilla Firefox

Archivo Editar Ver Historial Marcadores Herramientas Ayuda

sedecatastro.gob.es https://www1.sedecatastro.gob.es/CYCBienl

Sede Electrónica del Catastro

GOBIERNO DE ESPAÑA MINISTERIO DE ECONOMÍA Y HACIENDA SECRETARÍA DE ESTADO DE HACIENDA Y PRESUPUESTOS SECRETARÍA GENERAL DE HACIENDA DIRECCIÓN GENERAL DEL CATASTRO

CONSULTA DE DATOS CATASTRALES

INFORMACIÓN PROPORCIONADA POR **LA DIRECCIÓN GENERAL DEL CATASTRO DEL MINISTERIO DE ECONOMÍA Y HACIENDA**
¿Cómo se pueden obtener datos protegidos (titularidad y valor catastral) de los inmuebles y certificados telemáticos de los mismos?

■ **Cartografía**

VER PARCELA

Cartografía Catastro
Cartografía Internet
Consulta Descriptiva y Gráfica (PDF)

Datos del Bien Inmueble																
Referencia catastral	7433501YJ2773C0003RS Obtener etiqueta Copiar referencia al portapapeles															
Localización	PJ DR BARTUAL MORET 1 Es:1 Pl:B0 Pt:I2 46010 VALENCIA (VALENCIA)															
Clase	Urbano															
Superficie(**)	116 m ²															
Coefficiente de participación	0,366200 %															
Uso	Comercial															
Año construcción local principal	1972															
Datos de la Finca en la que se integra el Bien Inmueble																
Localización	PJ DR BARTUAL MORET 1 VALENCIA (VALENCIA)															
Superficie construida	47.590 m ²															
Superficie suelo	5.503 m ²															
Tipo Finca	Parcela con varios inmuebles (division horizontal)															
Elementos Construidos del Bien Inmueble																
	<table border="1"> <thead> <tr> <th>Uso</th> <th>Escalera</th> <th>Planta</th> <th>Puerta</th> <th>Superficie catastral (m²)</th> </tr> </thead> <tbody> <tr> <td>RECREATIVO</td> <td></td> <td>00</td> <td>I2</td> <td>102</td> </tr> <tr> <td>ELEMENTOS COMUNES</td> <td></td> <td></td> <td></td> <td>14</td> </tr> </tbody> </table>	Uso	Escalera	Planta	Puerta	Superficie catastral (m ²)	RECREATIVO		00	I2	102	ELEMENTOS COMUNES				14
Uso	Escalera	Planta	Puerta	Superficie catastral (m ²)												
RECREATIVO		00	I2	102												
ELEMENTOS COMUNES				14												

Datos del Bien Inmueble

Referencia catastral

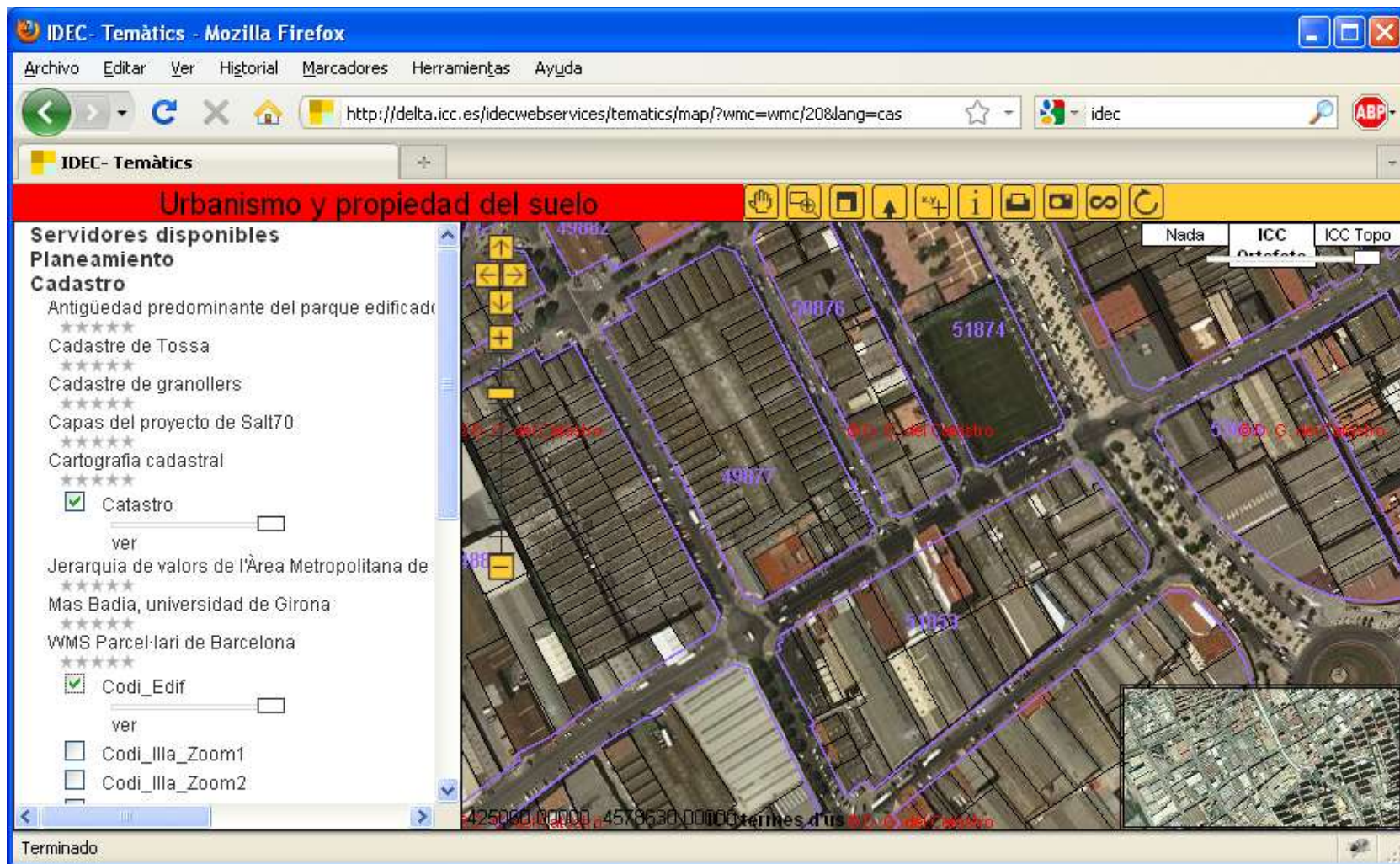
Localización

PJ DR BARTUAL MORET 1 Es:1 Pl:B0 Pt:I2
46010 VALENCIA (VALENCIA)

Terminado

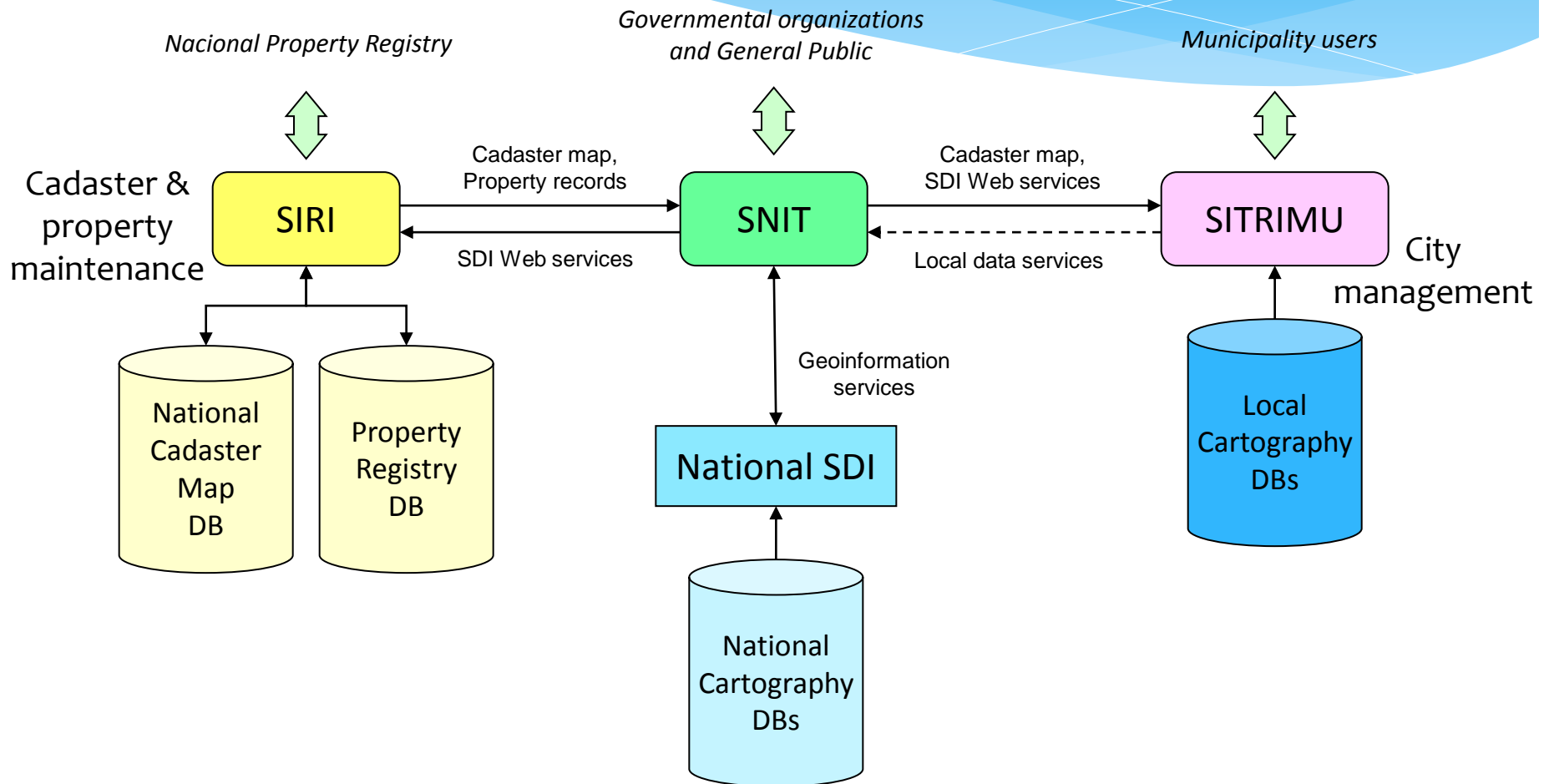
SDI and urban land management

Catalonia SDI: local services based on cadaster data



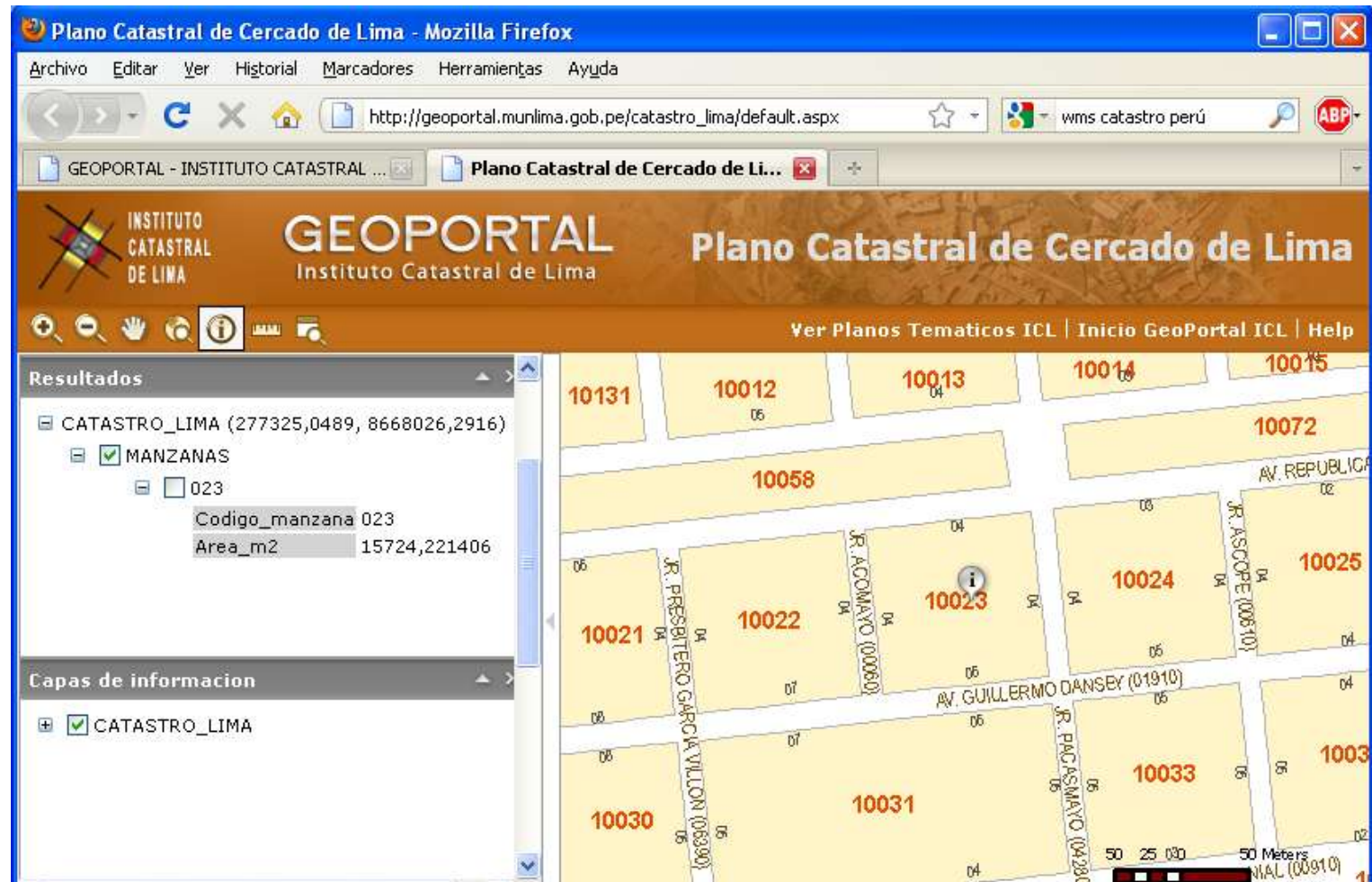
SDI and urban land management

SNIT in Costa Rica as land-management SDI



SDI and urban land management

Instituto Catastral Lima



Current SDI use trends

Menú principal

- Inicio
- Participantes
- ¿Cómo solicitar LocalGIS?
- Guía de funcionalidad
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Lista de Distribución [Comunidad LocalGIS]

SDI access from local governments, linked to local management tools

Current SDI use trends

Integration with e-government and online services

The screenshot displays the 'Sede Electrónica del Catastro' website in a Mozilla Firefox browser. The main window shows a map with several parcels outlined in purple, each labeled with a reference number: 74349, 74345, 75332, 74338, 75321, and 74335. A small window titled 'Identificar resultados' is open, showing the 'Referencia catastral de la parcela:' as 7433501YJ2773C. A red arrow points from this reference number to the 'Datos del Bien Inmueble' table in the main window.

CONSULTA DE DATOS CATASTRALES

OR LA DIRECCIÓN GENERAL DEL CATASTRO DEL MINISTERIO DE ECONOMÍA Y HACIENDA protegidos (titularidad y valor catastral) de los inmuebles y certificados telemáticos de los mismos?

Datos del Bien Inmueble	
Referencia catastral	7433501YJ2773C0003RS Obtener etiqueta Copiar referencia al portapapeles
Localización	P3 DR BARTUAL MORET 1 Es:1 Pl:B0 Pt:I2
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Coefficiente de participación	0,366200 %
Uso	Comercial
Año construcción local principal	1972

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Superficie suelo	5.503 m ²
Tipo Finca	Parcela con varios inmuebles (division horizontal)

Elementos Construidos del Bien Inmueble				
Uso	Escala	Planta	Puerta	Superficie catastral (m ²)
RECREATIVO		00	I2	102
ELEMENTOS COMUNES				14

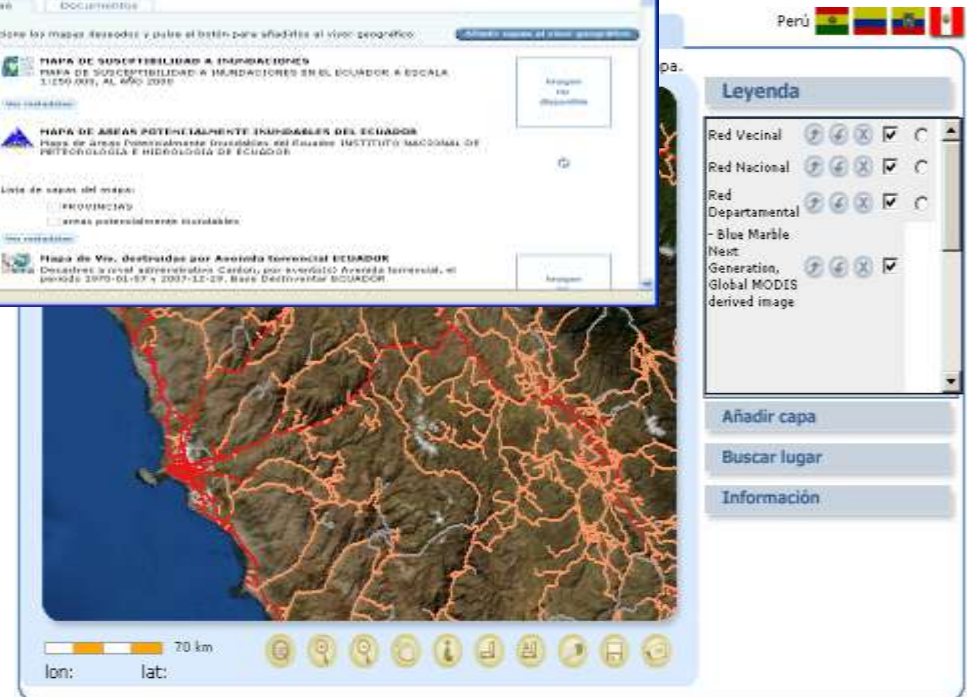
3501YJ2773C0003RS Obtener etiqueta Copiar referencia al portapapeles

OR BARTUAL MORET 1 Es:1 Pl:B0 Pt:I2

10 VALENCIA (VALENCIA)

Current SDI use trends

Integration of Distributed Information Systems including documents and statistics



Current SDI use trends



UNITED NATIONS | UNOOSA | UN-SPIDER
United Nations Platform for Space-based
Disaster Management and Emergency Response

HORN OF AFRICA FAMINE SATELLITE INFORMATION OVERVIEW

Click on the individual layers to view any additional information. The KML file of this page.

Drought Monitoring in Somalia using MODIS



SATELLITE INFORMATION REQUEST PRODUCTS

User Requests

These will be updated on an ongoing basis

☒ Areas of Interest-AOIs (sourced 28.07.2011, UNOCHA)

Satellites Tasked/Acquired

These will be updated on an ongoing basis

☒ SAFER Acquisitions (sourced 29.07.2011, WFP)

Mapping Products

These will be updated on an ongoing basis

☒ Refugee Camp Map - Detail - (sourced 29 July 2011, DLR)

☒ Drought Monitoring with HJ-1 in the north of Sudan (sourced 19 July 2011, NDRCC)

☒ Crop Growth Monitoring with MODIS in the north part of Sudan (sourced 11 July 2011, NDRCC)

☒ Overview Map of Refugee Camps in Dadaab, Garissa, N.Eastern, Kenya (sourced 1 August 2011, NDRCC)



EMERGENCY RESPONSE SERVICE Gmes

powered by
safer

The Gmes Emergency Response Service

How to access the Service

Preparing the Future

Latest news

An European Space-based mapping service to support crisis management



Access to sensors and alerts in quasi-real-time

Current SDI use trends

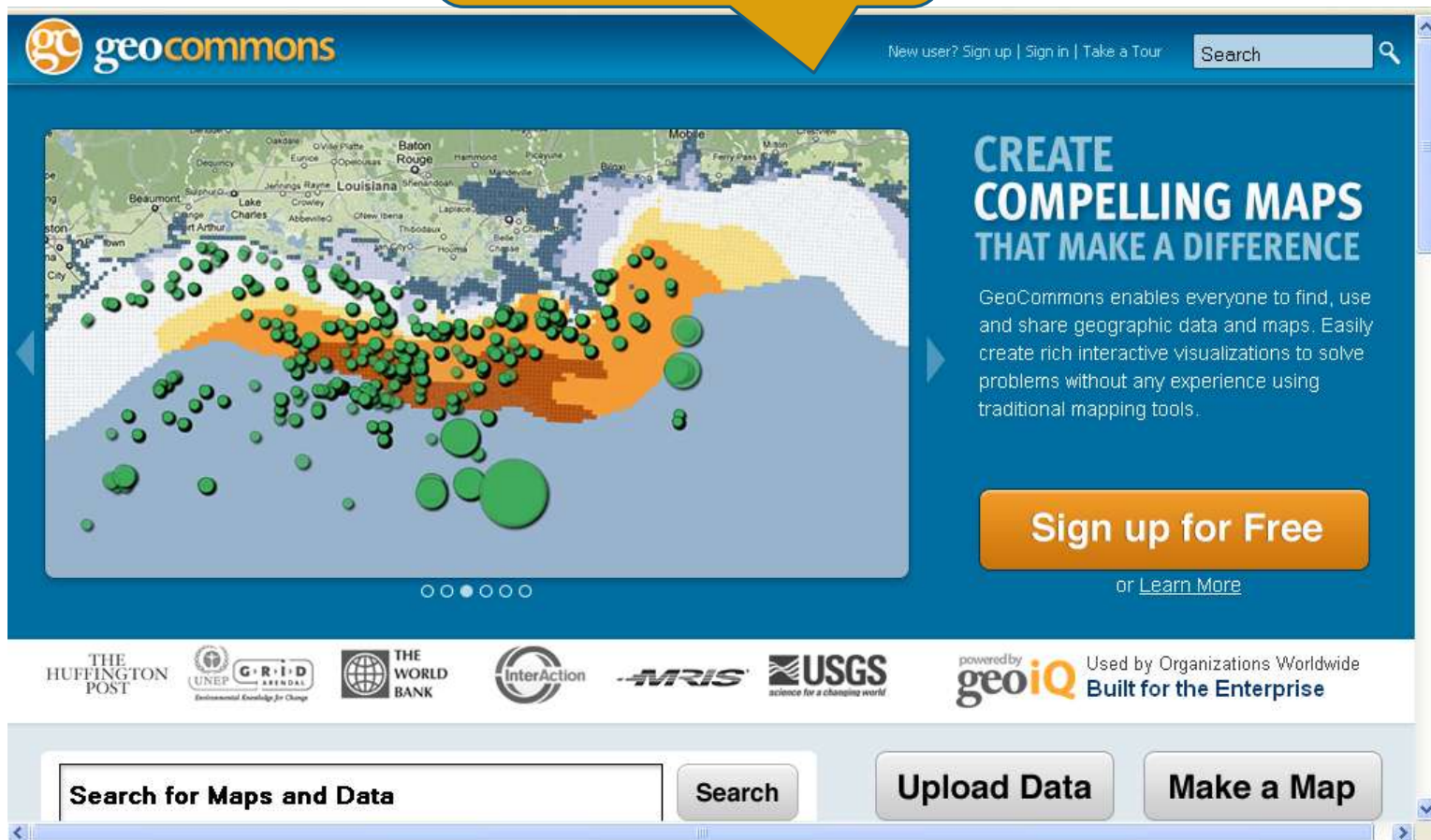


Use in mobile devices,
real-time information



Current SDI use trends

Crowdsourcing and
open communities



The screenshot displays the GeoCommons website. At the top left is the 'geo commons' logo. To the right are links for 'New user? Sign up | Sign in | Take a Tour' and a search bar. The main content area features a map of Louisiana with numerous green circular markers of varying sizes, representing geographic data. To the right of the map is a blue banner with the text 'CREATE COMPELLING MAPS THAT MAKE A DIFFERENCE'. Below this text is a paragraph: 'GeoCommons enables everyone to find, use and share geographic data and maps. Easily create rich interactive visualizations to solve problems without any experience using traditional mapping tools.' A large orange button labeled 'Sign up for Free' is positioned below the text, with a link 'or [Learn More](#)' underneath. The bottom of the page contains a row of logos for partner organizations: THE HUFFINGTON POST, UNEP GRID ARENAL, THE WORLD BANK, InterAction, ARIS, and USGS. To the right of these logos is the text 'powered by geoIQ Used by Organizations Worldwide Built for the Enterprise'. At the very bottom, there is a search bar labeled 'Search for Maps and Data', a 'Search' button, and two large buttons labeled 'Upload Data' and 'Make a Map'.

geo commons

New user? Sign up | Sign in | Take a Tour

Search

CREATE COMPELLING MAPS THAT MAKE A DIFFERENCE

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THE HUFFINGTON POST

UNEP GRID ARENAL

THE WORLD BANK

InterAction

ARIS

USGS science for a changing world

powered by geoIQ Used by Organizations Worldwide Built for the Enterprise

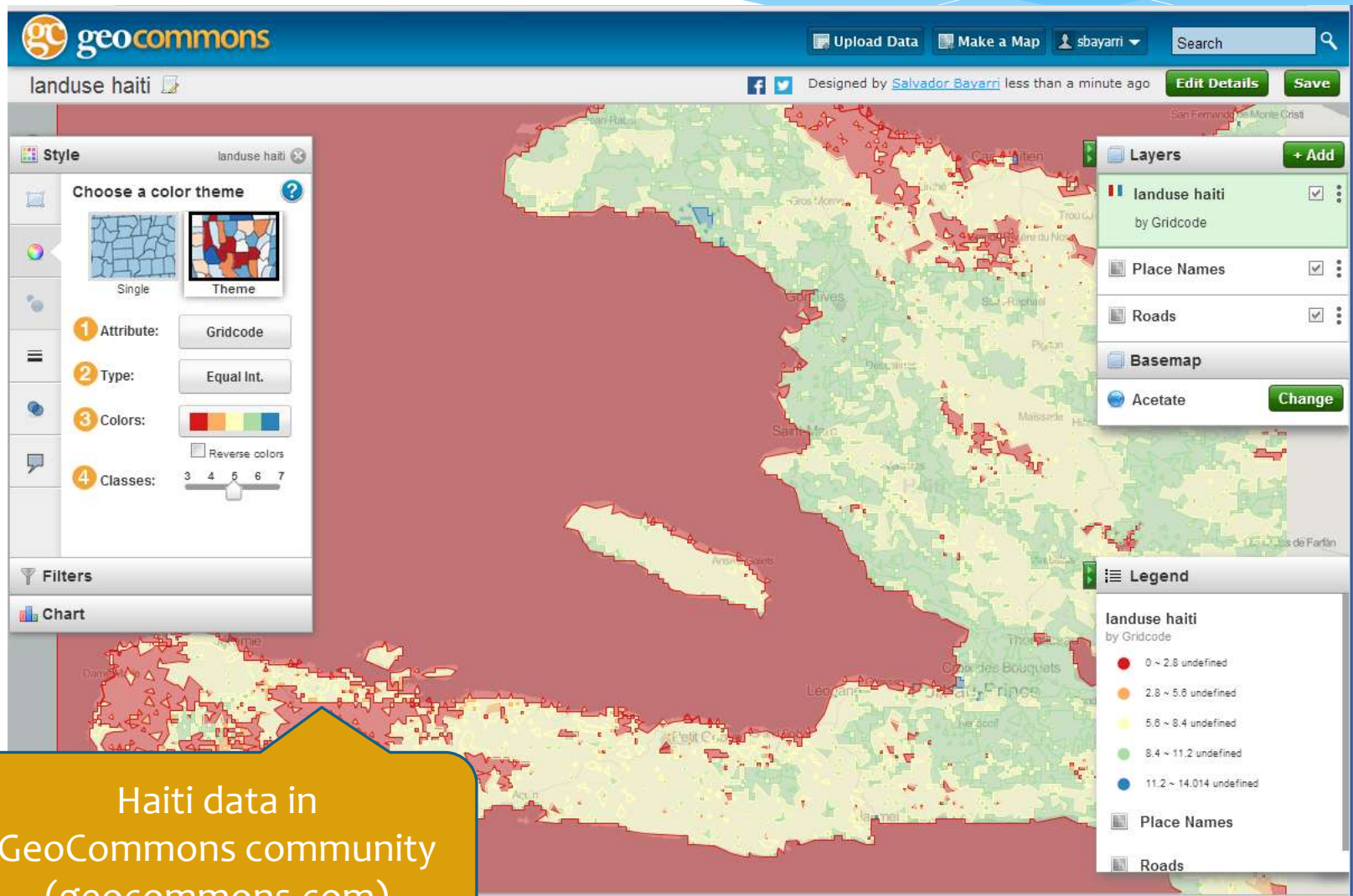
Search for Maps and Data

Search

Upload Data

Make a Map

Current SDI use trends



Haiti data in
GeoCommons community
(geocommons.com)

Current SDI use trends

www.openstreetmap.org/edit?editor=id#map=16/18.5508/-72.3437

OpenStreetMap View Edit History

Salvador Bayarri

Edit feature

Primary Road

Name
Boulevard Jean-Jacques Dessalines

One Way
Unknown

General

Foot	Unknown
Motor Vehicles	Unknown
Bicycles	Unknown
Horses	Unknown

Lanes
1, 2, 3...

Point Line Area Save

Rue Saint Joseph
Rue Tremasse
Rue des Remparts
Rue Macajoux
Rue Houille
Rue Bonne Foi
Rue Pavée
Rue Paul VI
Rue du Quai
Rue Montalais
Rue Lamarre

bing © 2012 DigitalGlobe, Imagery courtesy of USGS, Esri, GeoEye, State of Michigan
Edits by LEI laakkoh, magsen, s. Fount and 94 others

13.1

Crowdsourcing for cartography production: Haiti data in OpenStreetMap

Current SDI use trends

The screenshot displays the 'Lidar Online' website. The header includes the logo, a language selection dropdown, and links to 'Publish your LIDAR data' and 'Contact us'. A navigation sidebar on the left lists options like 'Mirage Technologies', 'Start', 'Social network', 'Account', 'My products', 'Find LIDAR data', 'Find users', 'Find companies', 'Help', and 'CLOSE SESSION'. The main content area features a search bar with the text 'Find LIDAR data, Raster, geoservices and more'. Below this is a 'Search by features' section with filters for 'From' (year), 'To' (year), 'Continent', 'Country', 'Price', 'Type', 'Keyword', and 'Private'. A 'Search' button is present. The 'Search Result' section shows a provider 'Asia Air Survey Co. Ltd' with details for a 2012 product from Osaka, Japan, described as 'Osaka Airborne LIDAR - [FREE]'. To the right, a 3D map view shows a street scene with a green point cloud overlay. The map interface includes a search address field, a '3D' toggle, and various map controls.

Marketplaces to buy and sell data
and services

Current SDI use trends

SDI and Big Data

Big data - Data Source diverse, huge and seemingly unrelated

Traditionally big data was the domain of the scientific, military or intelligence community

Increasingly local Governments are collecting or using big data to get different perspectives

Meaning of Data Depends on Context



We are here



The Pale Blue Dot - Image of Earth taken on 1990 by Voyager from 6 billion km away

Challenges in SDI implementation

- * Provide *access* to information
 - * No legal framework for open access
 - * Organizational resistance to open data access
 - * Analog information (printed maps, photos)
 - * No catalog
 - * Effort needed to create metadata
 - * Resistance of IT departments to change

⇒ Show benefits ⇒ Early, simple prototypes

Challenges in SDI implementation

- * Slow progress on *legal framework*
 - * Military-oriented view of GI
 - * Monopolies on creating & distributing GI
 - * Compartmentalized government structure
 - * Difficult to see short-term benefit within political election cycle

⇒ Start with informal SDI groups ⇒ Prepare drafts and reach consensus to gain political leverage

Challenges in SDI implementation

- * Cost of resources

- * High initial investment in acquiring/updating/digitizing/cataloging information
- * Training human resources
- * Problem of human resources rotation
- * Adapt/develop appropriate tools linked to SDI
- * A critical mass is needed to make SDI really useful

⇒ Make the case of SDI as national asset ⇒ get funds from national budget and programs

⇒ Promote savings in organizations linked to SDI implementation ⇒ get funds from organization budget

Challenges in SDI implementation

- * Lack of fundamental *information*
 - * No resources for updating cartographic base (orthophotos, DEM, base vector cartography), specially for detailed scales
 - * Institutional responsibilities are not clear for different scales, themes
 - * Lack of geocoding normalization and automation
 - * Linear reference systems (streets, highways)
 - * Statistical units
 - * Toponyms

⇒ Form a working group on fundamental information ⇒ create a national cartographic plan

⇒ Create a working group on data and service normalization ⇒ create partnerships with Post Office, banks, transportation, tourism actors

Challenges in SDI implementation

- * *Managing expectations*

- * Short-term political goals, seek visible results soon
- * SDI may be seen as silver bullet
- * If the process fails, it will be more difficult to get started again

⇒ Create realistic strategic plan with phases, visible & useful intermediate results

⇒ Make implementation speed conditional to budget allocation, but don't push an all-or-nothing approach

SDI challenges in A&B: open discussion

- * Suggested topics
 - * National and thematic policies on information sharing
 - * Status of data and infrastructures
 - * NSDI progress
 - * Application in disaster risk management, climate change, natural resources management...
 - * Main challenges identified and possible solutions
 - * Main information needs
 - * How can the World Bank contribute?