

insights in DRM

A Practitioner's Perspective on Disaster Risk Management in Latin America & the Caribbean

Open Data for Resilience in the Caribbean

"In my role as a GIS analyst, I've been able to visualize all the primary roads using SLING and identify the flood impacts from Hurricane Tomas (2010) to assess where new roads should be built. By using Quantum GIS (QGIS), I am able to update the data sets to prepare a culvert database, specifically to look at flood risk. The GeoNode is also helping us to manage the data so we don't have to spend money over and over again by collecting the same data. This is helping us to focus our efforts and budget on using the data to build resilience."

—Lance Octave

Ministry of Infrastructure, Port Services & Transport, Saint Lucia

Challenge

Data is essential to inform decisions aimed at reducing disaster risk. In the Caribbean – considered one of the most vulnerable regions in the world – governments face two fundamental decisions when it comes to disaster risk reduction: **where and how to build**. Answers to both these questions should rely on disaster risk analyses to inform where and how to build safer, less vulnerable structures. Risk analyses can also be used to take corrective measures to reduce risk of existing structures in order to protect citizens and investments against damage and economic losses caused by natural hazards. Without access to quality geospatial data, it is impossible to do good risk analyses.

Unfortunately, geospatial data in Caribbean countries is not readily available, as it is stored by different ministries and agencies that separately manage and collect data in various forms (e.g. paper or digital files). This makes it challenging for ministries of physical planning and works to access, process and visualize data to fulfill their respective responsibilities to adequately conduct risk analyses for territorial planning, site-selection and construction design. Coupled with the fact that data is often collected using inconsistent mapping standards and lacking metadata, it is difficult to locate the source, and assess the quality of the data – let alone share the data with other users and decision-makers. This often results in high-transaction costs that demand more resources to collect, validate, transform and use data, leading to insufficient generation and use of risk information for decision making, particularly when it comes to identifying and prioritizing investments.

Intervention

In order to foster a culture of informed decision-making, governments across the Caribbean region are implementing new technologies and data-management practices, engaging in regional communities,

and piloting multi-sector investment strategies to address disaster and climate change risk. The Latin American and Caribbean Disaster Risk and Urban Development (LCSDU) team of the World Bank is supporting Caribbean governments in the use and application of OpenDRI² tools and technologies to improve geospatial data management and risk analysis, as well as to harmonize national and regional data sharing and management practices. These tools, such as GeoNode, OpenStreetMap (OSM), Quantum GIS, Open Data Tool Kit (ODK), are designed to promote collaboration and link the use of geospatial data to specific decision-making processes such as risk analysis. The **GeoNode** is the primary web-based tool currently being used by ministries of physical planning (among others) to store, share and visualize spatial data. The GeoNode makes it simple to share data among multiple users, which allows various government entities to access data they were not able to access previously, or did not know existed (See map 1).



Overview of the Advanced Training on Spatial Data Management

In collaboration with regional development partners³, open data policies and open source tools are increasing the access, harmonization and use of geospatial data across the Caribbean region. Agencies like the Caribbean Community Climate Change Center are already exploring ways to connect to national GeoNodes by creating a regional node to access data for regional climate risk analyses. With the University of West Indies in Trinidad and Tobago, among others, a series of **regional workshops and trainings** are underway that aim to improve the capacity of physical planners and engineers (end-users of data), and software developers (technologists) to customize and apply these tools to improve workflow and increase data access for day-to-day decision-making processes.

Future capacity-building activities aim to improve governments' abilities to integrate risk information into the physical-planning and construction processes to better inform decisions on where to build, how to design infrastructure, and how to develop their limited land resources. Since 2011 in **Grenada**⁴, a community of practice and online forum – **Caribbean Open Data Management Community**⁵ – has grown to more than 150 members of data and risk management practitioners – creating a network that is promoting a culture of open data and informed-decision making in their own countries, agencies and communities.



Map 1: Click on the country to see the active national and regional GeoNodes across the region.

Why open-source?
 Proprietary software and tools are expensive, and the cost of the licenses is prohibitive – often prompting practitioners to use unlicensed software in budget-strapped countries. Open-source software and tools are free to download, use and modify, and there is a rapidly growing open-source community embracing these tools and providing support to the user community through a virtual community of practice.

Outcome

Across the region, spatial data managers and practitioners are beginning to observe the benefits of an open data philosophy and open-source technologies. National and regional GeoNodes are improving everyday workflows, providing access to all ministries and agencies to view, download and use geospatial data to inform decisions. In **Saint Lucia**, a national movement of GeoNode users is promoting the **Saint Lucia Integrated National GeoNode (SLING)**⁶, which is enabling the Ministry of Infrastructure, Port Services and Transport to access spatial data of buildings and roads to evaluate conditions, schedule maintenance and overlay hazard information, such as floods and landslides, to consider sites for new construction; in **Saint Vincent and the Grenadines**, the Physical Planning Unit is using hazard data to create maps to assess the risk of floods and tsunamis in two of the most populated areas in Kingston and Georgetown; and **Haiti** is hosting exposure, hazard and risk analysis information that was created after the Earthquake of 2010 in a GeoNode platform **Haitidata.org**. The platform is now being handed over to Haitian national cartographic and GIS agency (CNIGS) with emphasis in its sustainable use and keeping the platform open.

In **Dominica**, the Ministries of Physical Planning and Social Services are conducting their annual shelter assessment to determine if the shelters are structurally suitable during hurricane events, as well as to plan for rehabilitation and retrofitting. For the first time, this national-wide collection is using this opportunity to **georeference all the emergency shelters**, collect more in-depth building attribute data, and site-specific information providing important indications of the hazard situation. This data will be used to determine the vulnerability of the structures to a given hazard, namely hurricanes.

The raw survey data, as well as results of the ongoing assessment, can be seen on **Dominode** – the national data sharing and management platform that is being used to house the data as input for risk analysis. Similarly in **Belize**, the entire network of primary and secondary roads are being surveyed and relevant attribute data are being collected to be used to prioritize investments based on a multi-criteria evaluation – a decision making tool that integrates economic, social, environmental, cultural and physical factors. The prioritization process will help in making decisions on where to invest scarce financial resources in order to most efficiently reduce vulnerability and create climate resilience.

By improving access to geospatial data management, governments are better able to conduct risk analyses to inform decisions that move the Caribbean towards building disaster and climate resilience.

Endnotes

- 1 Geospatial data refers data that has positional attribute, including data collected using remote sensing techniques or data collected in the field.
- 2 Open Data for Resilience Initiative (OpenDRI) began in 2011 by the Global Facility for Disaster Reduction and Recovery. <https://www.gfdrr.org/opendri>
- 3 Namely the Caribbean Community Climate Change Center (CCCC), Caribbean Catastrophe Risk Insurance Facility (CCRIF), MONA Geoinformatics Institute, Organization of Eastern Caribbean States Secretariat (OECS), The Nature Conservancy (TNC), University of West Indies (UWI).
- 4 The Eastern Caribbean Regional Open-Source Geospatial Data Sharing and Management Workshop (10/2011). <http://go.worldbank.org/FGTJ7ON9D0>
- 5 This community is open all practitioners to improve OpenDRI in the Caribbean. (<https://collaboration.worldbank.org/groups/caribbean-open-data-management>).
- 6 SLING was launched in March 2012 within the Ministry of Physical Development, Housing and Urban Renewal (<http://go.worldbank.org/W6IM9NBVZ0>).

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