Draft Belize National Spatial Data Infrastructure (NSDI) Policy

National Spatial Data Infrastructure (NSDI) Working Committees

Belize

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ACRONYMS

BNSDI – National Spatial Data Infrastructure

GIS – Geographic Information System

GOB – Government of Belize

IP – Internet Protocol

ISO – International Organization of Standardization

IT – Information Technology

KB - Kilobyte

LIC – Land Information Center

MNRA – Ministry of Natural Resources and Agriculture

NEGIS – National Environmental and Geomatics Information System

NGOs – Non-governmental Organizations

NSDI – National Spatial Data Infrastructure

TBSL – Total Business Solutions Limited

TORs – Terms of Reference

EXECUTIVE SUMMARY:

INTRODUCTION:

The National Spatial Data Infrastructure (NSDI) is a national initiative that is driven by multiple stakeholders, particularly agencies in the country that are actively developing spatial data layers. The focal Ministry leading the development of Belize's NSDI is the Ministry of Natural Resources and Agriculture in partnership with various local and regional agencies.

BACKGROUND:

A National Spatial Data Infrastructure (NSDI) is an asset for all nations and should be considered as a key part of a country's wider infrastructure assets such as roads, electricity, telecommunications networks etc. It is conceived to be: an umbrella of policies, standards, and procedures under which organizations and technologies interact to foster more efficient use, management and production of spatial data." The main goal of the NSDI is to develop the rules and standards for the sharing of spatial data in Belize – this will in turn contribute to sustainable development.

Spatial data is concerned with the size, area and position of any location or phenomenon. In historic times, static maps were used to portray spatial data; in modern societies digital spatial data can be "mapped" and analyzed – translating to better decision making processes.

The process of developing a NSDI for Belize began in a few years ago with the recognition of the importance of data in land management, monitoring of environmental issues, disaster reduction, health monitoring, and other salient issues affecting the country, and more importantly, the potential benefits in sharing data and having a mechanism in place to facilitate such sharing. The National Environmental and Geomatics Information System (NEGIS) in 2006 was one of such concepts relevant to the development of the NSDI. Effort towards developing this data sharing mechanism was revitalized in 2009 with the 1st NSDI Conference and most recently in 2011 with the 2nd NSDI Conference. Furthermore, there are working committees established with Terms of Reference (TORS) – see Annex I, for the development of the NSDI through participation of some of the most technically sound spatial data practitioners in the country.

The NSDI is a comprehensive process that will address the existing barriers to spatial data sharing e.g. fear of sharing due to lack of security of ownership issues, and lack of interoperability of different data sets produced by different entities.   The five (5) NSDI Working Committees composed of the most technically competent spatial data practitioners in the country are as follows:

1. *Data Quality and Data Standards* – is the Working Committee set up to establish standards and norms for spatial data;

2. *Data Ownership and Security Issues* – is the Working Committee set up to ensure that ownership of data is secured and sensitive data layers are not compromised, while at the same time ensuring that equitable access to spatial data is provided;

3. *Network Assets and System Architecture* – is a very technical Working Committee set up to ensure that the NSDI network components are in place (hardware, software etc.)

4. *Maintenance and Oversight* – this Working Committee is set up to ensure that best practices are followed in the establishment of Belize's NSDI to ensure that it is sustainable and will address issues such as the equitable sharing of expenses for the up-keep of the NDSI.

5. *The Executive Committee* – this is a key Working Committee in ensuring that the entire NSDI process is sustained and successful. It is made up of the Chairperson and Vice-Chairperson of each of the above Working Committees (these were newly elected at the 6th October, 2011 Working Group Workshop held in Belmopan), and the Head of the Land Information Center (LIC). This Work Group was also established to address the issue of inadequate communication, which was highlighted as the major factor in the discontinuation of the process, which began back in July 2009 with the 1st NSDI Conference. This Group will also address the issue of financing for the NSDI, which was identified as the second major challenge.

The above Working Committees have been established to act as the "work-horses" to develop Belize's NSDI. The policies and protocols that these Work Groups will draft will also directly contribute to its sustainability by putting in place policies for equitable cost-sharing for the long-term implementation of the NSDI.

POLICY STATEMENTS

Data Quality and data standards statements:

> 1. Belize shall adopt the North American Profile of ISO 19115 metadata standards, to comply with international standards to allow for interoperability.

2. Data owners that developed data layers prior to adoption of the ISO 19115 standards will be provided with a compliance period to provide the minimum requirements.

3. Data shared via geoportals shall be in both WGS84 and NAD16N datums to allow for data sharing regionally and internationally. The geographic coordinates (Lat/Long) system shall also be used.

Network Architecture and Platform Standards statements:

1. Access to data will be made available through the nsdi.gov.bz / bnsdi.gov.bz domains.

2. The BNSDI Geoportal will be hosted on the nsdi.gov.bz / bnsdi.gov.bz domains.

3. The Geoportal will be utilized as a central gateway for GIS Nodes within the country.

4. GIS Nodes must register with the Geoportal's governing body in order for its services to be available via the portal.

5. Geoportal membership shall be required for non-publicly accessible data i.e. data that may have some use restriction.

6. A BNSDI GIS Node is defined as any entity operating within the country of Belize that wishes to share its GIS resources via the Geoportal. The Geoportal will facilitate communication between data nodes and interested data consumers.

7.   The Geoportal will cater to allowing connectivity to non-Belizean entities for international visibility. As such it will allow other geoportals to harvest data on publicly available services and services with restrictions put in place by the individual nodes with their permission.

8. GIS Nodes Minimum requirements include but are not limited to:

    a. It is optional for a node to have its own Internet Domain Name.

    b. A node must have its own Internet connection of at least 512 KB with a public Internet Protocol (IP) address; this is to ensure that data is accessible via the same IP address unless otherwise changed by the node owner.

    c. Nodes must be running on either of the following GIS Server technologies:

        i. ESRI ArcGIS Server (version 9.x or higher)

        ii. GeoServer

        iii. MapServer

    d. GIS Nodes will need to allow access to the Geoportal's harvester so that it may update any services provided by that node unto the Geoportal itself.

9. GIS Nodes are responsible for granting access and defining any restrictions to their own data. Such should be documented within the metadata of the various services provided.

10. Any new service or updated services encountered by the Geoportal's harvester will be first reviewed by the portal administrator before being made available. This will ensure the appropriate type of visibility is provided for the individual service and that the service meets the required standards.

11. Documentation on setting up the various approved server infrastructures will be made available via the bnsdi.gov.bz Wiki and discussions on topics can also be found on its forums.

12. The bnsdi.gov.bz wiki shall be the source of information for all standards, policies and requirements pertaining or related to the geoportal and to GIS nodes.

Data Access and Security statements:

1. This policy is developed in order for GOB and all stakeholders to streamline access to data and guarantee the consistency of standards and guidelines.

2. A web portal will be developed to enable users to search, query, and discover spatial data, to serve as a link between data users and data producers, and which will also provide built in security features.

3. Agreements/licenses shall be developed to clearly define terms of use, access, and distribution protocols for spatial data.

4. A National Geospatial Data Clearinghouse will be created to support Geospatial Data Catalogues in the BNSDI node. The clearinghouse will allow producers/creators to advertise the availability of data and users to search for, access, and use the data based on policies that promote easy, equitable, and minimally constrained access and use of data.

5. The owner of a geospatial dataset shall be the person or institution who created the dataset. The owner(s) of a dataset shall be but not limited for the responsibility of quality control and assurance, data content and formats, validation and maintenance, storage and security, maintenance and updates of metadata to the geoportal. Ownership of data by the official entity responsible with jurisdiction should be respected e.g. crime data is owned by Police, health data is owned by health, cadastral data is owned by Lands etc.

6. The custodian of the data shall be the person(s) or organization who is responsible for the production, storage, management and distribution of the dataset on behalf of another organization. E.g. LIC is the custodian of various datasets for GOB.

7. The data creator shall own the copyright of the data produced. Therefore, for value-added data, the producer shall own the copyright of only the value-added component of the data. The original data creator shall also be cited in the metadata and resulting map products.

8. There shall be two basic categories of data access: Restricted/Sensitive and Public Access.
   1. Restricted spatial data relates to matters of national security; such data will only be available to users by agreement of data owner on a case-by-case basis under specific conditions stated in a license agreement.
   2. Foundation datasets should be available with limited restriction, on a non-discriminatory basis for reproduction and distribution.

9. The mode of access shall be defined in the access portal and it may include on-line access (view-only, link to user's database or off-line access (hardcopy delivery or softcopy deliver on storage media such as USB drives, CD_ROM).

10. All data sets and published information used in the BNSDI will be identified with a citation; for data sets an indication of how the data may be accessed should be provided.

11. Data owner(s)/producers shall establish a metadata database server as a NSDI node that will be linked to the BNSDI Clearinghouse.

12. Acceptable security measures shall be put in place to minimize damage to, unauthorized access, modification and loss of current and archived data. This includes but not limited to access authentication devices, software devices (such as password protected to make files read-only when unauthorized downloading occurs).

13. Validation of data sets shall be done by the relevant entity responsible for data prior to publication via the NSDI portal and shall be properly cited to ensure data owner and data creators are appropriately credited.

Maintenance and oversight statements:

1. Ownership of the NSDI – The National Spatial Data Infrastructure (NSDI) is a valuable national resource developed for the benefit of all stakeholders. The Ministry of Natural Resources and Agriculture (MNRA) for the Government of Belize (GOB) shall serve as the steward of this resource.

2. Stakeholders shall commit to the maintenance, validation, description, accessibility, and distribution of spatial data. Stakeholders shall manage geographic data in a way that facilitates data sharing and use by other stakeholders and the general public. Data sharing has to become an integral part of the operations and culture of each participating stakeholder and their employees.

3. GOB funding for the establishment of the basic NSDI will be provided for this national initiative to help the nation as a whole. This first step of the GOB will bring confidence for proper development of the NSDI and encourage private investment.

4. The NSDI Committee established will be responsible for the development of the components of Belize's NSDI and composed of the top level stakeholders from across the participating stakeholders. This body will be charged with drafting the overall policy and

submitting draft policies and protocols to the Cabinet for approval and allocation of resources as required.

5. Costs for operation, modification, and maintenance and responsibility for the NSDI shall be shared in an equitable manner among stakeholders and users. The MNRA on behalf of GOB shall be responsible for the basic infrastructure costs and modification costs will be equitably distributed among other stakeholders and users. Sustainable financing for the NSDI will be made possible through various mechanisms, including:
   - GOB through establishment and annual budgets (e.g. for Ministry of Natural Resources and Agriculture) bears basic costs;
   - ESRI distributors such as TBSL – special considerations based on data sets used;
   - User Groups subscription fees – varying costs dependent on levels of access and contribution – need for more discussion on how this can be structured.
     - Private industries
     - Government agencies
     - Educational institutions
     - NGOs
   - Funding/Grants from National, Regional and International agencies that support NSDI development. Strategic partnerships among local agencies are important.

6. Development of Belize's NSDI will be done incrementally using a phased approach and taking into consideration factors such as data format (digital or hardcopy), the ownership and location of the data, data sharing technology available, and access and security issues. Provisions will thus be made for changes and additions to NSDI policies and structures as needed by the NSDI Executive Committee.

7. Amendments to the NSDI policy will be done after year 1, thereafter every 2 years to reflect advances in available technologies, structure of the NSDI framework, expansion in user groups and other considerations.

8. A Maintenance schedule shall be developed by the Network Architecture and Platform Standards Committee for IT hardware and software that currently exist and new IT hardware acquired through capital investment to support the sharing of data.

9. Each data producing entity will catalogue their datasets and data elements, adhering to the best practices discussed in the Data Quality and Data Standards Policy statements. Each data owner will be responsible to maintain their catalogue.

10. A Maintenance protocol shall be developed by data owners for data assets used in the NSDI. It should allow for communication on downtime of services, updates on services, and other such provisions.

11. No fees are to be charged for Public data accessed by participating stakeholders. Data owners can levy charges for certain data and on users as they deem necessary.

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