

The SALB project: Current Status and new challenge for the Americas

S. Ebener¹, B. Brookes², Y. Guigoz¹, Z. El Morjani¹, S. Chang²

¹ WHO, 20 av. Appia,
1211 Geneva 27,
Switzerland,
Tel.: +41 22 791.47.44
Fax.: +41 22 791.43.28
Email: ebeners@who.int

² Dag Hammarskjold Library
United Nations
New York, N.Y. 10017
Tel: +1 212 963 7425
Fax +1 212 963 1779
Email: brookes@un.org

Abstract

The progress made in information technology has increased the flow and level of detail of information now available. This sometimes makes it hard to select the right information for the right context. One of the difficulties is the lack of proper documentation regarding the spatial and temporal representation of this information.

In order to respond to this issue regarding information attached to administrative units, the Second Administrative Level Boundaries data set project (SALB) has been launched in 2001 in the context of the United Nations Geographic Information Working Group (UNGIWG).

This project is the first attempt, proposed by UNGIWG, to take advantage of existing information and data about administrative boundaries and to meet the general need for a consistent global coverage down to the second administrative level including the changes that occur through time.

Firstly, this paper describes what SALB is and how the process in place is used for collecting, compiling, cleaning and publishing validated information and maps for the Americas. It then describes the state of the continent's progress before presenting the new objective that the project has undertaken: make SALB reach the present.

The objective of this paper is to serve as the basis for discussion during the 8th UN Regional Cartographic Conference for the Americas regarding the generation of a resolution which would support this objective.

1. What is SALB ?

SALB is a UN project which has been launched in the context of the activities of UNGIWG and in the continuity of different efforts that took place in the middle of the 90's where the delimitation of the administrative boundaries was needed for the creation of population distribution grids (Tobler et al., 1995).

From its original objective, which was to provide the international community with a global standardized GIS layer containing the delimitation of the administrative boundaries down to the 2nd sub national level representative of January 2000, the project has moved into providing a working platform for the collection, management, analysis, visualization and sharing of sub national data. This is done for example through the provision of a flexible and intuitive coding scheme that can be applied to any country, independently from its administrative structure. In this regards the SALB project goes further than the recommendation provided by the Statistics Division of the department of Economic and Social Affairs in the frame of the "*Handbook on geographic information systems and digital mapping*" (UN, 2000) as the coding scheme proposed is based on a structure that allows its constant update in order to take into account the changes that occurs through time regarding the naming and delimitation of the administrative units.

In order to be effective, this data set has to be based on validated information received from the countries and integrates the highest level of standardization possible not only in terms of methods and process but also in terms of content.

Specific standards and protocols have therefore been developed and used since the beginning of this project, which includes:

- an international borders standard developed by the UN Cartographic Section in order to be able to create a global data set in which each country map would be compatible with the neighbouring countries
- an editing protocol in order to insure the comparability between the countries in terms of quality
- a coding scheme for the identification of each administrative unit through time and space
- a metadata profile that is associated with the information in order to insure the documentation of the digital maps
- a validation process of all the information by an official entity within the country (generally the National Mapping Agency)

The description of these standards as well as the protocols can directly be found on the SALB project web site (http://www3.who.int/whosis/gis/salb/salb_home.htm).

Without counting the National Mapping Agencies (NMA) themselves, this project coordinated by the Evidence and Information for Policy (EIP) cluster at the World Health Organization (WHO), has developed and currently manages a network of more than 50 institutions, including:

- 20 UN agencies such as the UN Economic Commission for Africa (UNECA), the Food and Agriculture Organization (FAO), the World Food program (WFP), The United Nations Environment Programme (UNEP), the United Nations Children's Fund (UNICEF), The United Nations Development Programme (UNDP) or the World Health Organization (WHO)
- WHO Regional Offices such as the Pan American Health Organization (PAHO)
- Other Non governmental organizations such as the International Center for Tropical Agriculture (CIAT)

- governmental institutions such as the U.S. State Department
- academic institutions such as Columbia and Yale University

These partners provide access to their data, skills and/or capacities in house or in the countries. In this context it is important to underline the crucial role that UNECA plays by being the editing node for the African continent. Through this network, the SALB project also aims at reducing duplication of efforts within the UN regarding this specific layer of information.

Taking advantage of this network and using the developed standards and protocols, the project is going through the following process (Ebener et al, 2004):

1. The NMA of each country is contacted in order to obtain the list of administrative units at the 1st and 2nd level as observed in January 2000 in the country. Once validated and coded the table is posted on the SALB web site
2. The NMA's assistance is then requested again in order to obtain the historic changes observed at the 1st administrative level since 1990 and at the 2nd level since 2000. The coding scheme is then integrated in these tables before posting them on the SALB web site
3. In parallel to the collection of the historic changes, a comparison between all the maps (digital, paper or image) that have been compiled concerning the delimitation of the administrative units and the January 2000 table is done in order to identify the map or combination of maps to be used for the rest of the process
- 4 From this point two situations may occur:
 - 4.1 we have all the necessary information and authorization for generating a digital map. In this case we can move forward with the process and start the editing work
 - 4.2 we do not have all the information and/or authorization. In this case, further search and contact are necessary in order to obtain the missing information or the authorization using for example the memorandum of understanding specifically design for the context of the project
5. once we have all the necessary materials, the editing process can start in order to obtain a shape file representing the administrative structure of the country as observed in January 2000 and containing the administrative units names and codes in its attribute table.
6. this map is then sent for validation to the NMA in order to ensure that it reflects the correct situation observed in the country in January 2000 in terms of international and administrative boundaries
7. Once validated the digital map and its metadata is posted on the SALB web site for free non-commercial download. The metadata record is also posted on the FAO GeoNetwork data portal giving therefore a broader access to the SALB maps

At the end of this process the users have access to the following products

- 1) a table listing the names of the 1st and 2nd level administrative units as observed 1 January 2000 and validated by the NMA. The correspondence between the levels is also indicated and the SALB coding scheme implemented in this table.
- 2) two tables presenting the historic changes observed at the 1st level since 1990 and the one observed at the 2nd level since 2000. Both tables including the SALB coding scheme as well.
- 3) a digital map showing the delimitation of the 1st and 2nd level administrative units as reported in the table validated by the NMA for January 2000. This map has to correspond to the characteristics mentioned in the introduction which includes its validation by the NMA of the country in question.

2. Where are we with SALB in the Americas ?

Among all the continents, the Americas is the closest to achieve the 2000 version of the database as well as having an up-to-date database of historic changes down to the 2nd sub-national level.

The Americas count 50 territories. In the context of SALB the efforts have firstly been concentrated on 35 of them (Table 1 and map at the end of this paper). This section therefore reports on the progresses made with these 35 territories.

Based on the information received from the NMA, 5 of these territories (Antigua and Barbuda, Barbados, Dominica, Grenada and Saint Vincent and the Grenadines) do not have administrative sub divisions in the sense we do define them in the context of this project and 5 other ones do not have a 2nd administrative level (Jamaica, Saint Kitts and Nevis, Saint Lucia, Trinidad and Tobago, Uruguay).

The NMA of all the concerned territories have been contacted in order to obtain the list of administrative units as observed in January 2000. Apart for the Bahamas an answer has been received from all of them and the corresponding coded table posted on the SALB web site.

When it applies, coded historic changes are available for 26 territories at the 1st level and 19 at the 2nd level but none of them are reaching 2005 at the moment.

Maps representative of the situation observed in January 2000 for 26 territories have been sent for validation. The validation has been received for 7 of them so far, all these map being freely downloadable from the SALB web site.

On the map at the end of this paper we can observe that we are still missing information in order to update the map at disposal for 6 territories (Belize, Cuba, Dominican Republic, Ecuador, Paraguay and Venezuela). For 3 other ones (Brazil, Chile and Mexico) further discussion with the NMA needs to take place in order to be authorized to use their map in the context of this project.

In order to find the missing information a new page has been recently created on the SALB web site: http://www3.who.int/whosis/gis/salb/salb_help_us.htm. This page contains the indication of the information or document we are looking for in order to update or move forward with the editing process.

Country	List January 2000	historic changes 1st admin level	historic changes 2nd admin level	Validation process for the map
Antigua and Barbuda	no admin divisions	no admin divisions	no admin divisions	Under process
Argentina	yes	1990-2002	2000-2002	Under process
Bahamas	under process	-	-	-
Barbados	no admin divisions	no admin divisions	no admin divisions	Under process
Belize	Yes	1990-2004	2000-2004	Validated
Bolivia	Yes	1990-2003	2000-2003	Validated
Brazil	Yes	1990-2003	2000-2003	-
Canada	Yes	1990-2002	under process	Under process
Chile	Yes	1990-2003	2000-2003	-
Colombia	Yes	under process	under process	Under process
Costa Rica	Yes	1990-2004	2000-2004	Under process
Cuba	Yes	1990-2003	2000-2003	-
Dominica	no admin divisions	no admin divisions	no admin divisions	Under process
Dominican Republic	Yes	under process	under process	-
Ecuador	Yes	1990-2004	2000-2004	-
El Salvador	Yes	1990-2002	2000-2002	Under process
Grenada	no admin divisions	no admin divisions	no admin divisions	Under process
Guatemala	Yes	1990-2004	2000-2004	Under process
Guyana	Yes	1990-2003	2000-2003	Under process
Haiti	Yes	1990-2003	2000-2003	Under process
Honduras	Yes	1990-2004	2000-2004	Under process
Jamaica	Yes	1990-2002	no 2nd admin level	Validated
Mexico	Yes	1990-2004	2000-2004	-
Nicaragua	Yes	1990-2002	2000-2002	Under process
Panama	Yes	under process	under process	Under process
Paraguay	Yes	1990-2003	under process	-
Peru	Yes	1990-2003	2000-2003	Under process
Saint Kitts and Nevis	Yes	1990-2003	no 2nd admin level	Validated
Saint Lucia	Yes	1990-2004	no 2nd admin level	Validated
Saint Vincent and the Grenadines	no admin divisions	no admin divisions	no admin divisions	Under process
Suriname	Yes	1990-2002	2000-2002	Under process
Trinidad and Tobago	Yes	1990-2002	no 2nd admin level	Validated
United States of America	Yes	1990-2002	2000-2002	Validated
Uruguay	Yes	1990-2002	no 2nd admin level	Under process
Venezuela	Yes	1990-2003	2000-2003	-

Table 1 - State of progress regarding the tables and maps produced in the context of the SALB project

3. Making SALB reach the present by the end of 2006

During the 5th UNGIWG plenary meeting, which took place in Geneva in October 2004, the objective to make the SALB data set "reach the present" by the end of 2006 was proposed.

Reaching this objective would mean that the SALB data set would have reached, by that time, a full coverage in terms of:

- list of administrative units as observed in January 2000
- historic changes going from 1990 to 2006 at the 1st administrative level and from 2000 to 2006 at the 2nd administrative level
- administrative boundaries maps with one map for each period of representativity observed between 2000 and 2006

If this objectives is going to represent an important challenge in some area of the world we are very close to be able to reach it for the Americas.

If we look at the state of progress reported in section 2 for the 35 territories considered in SALB, we can see that this objective would be reached if we:

- obtain the last table for January 2000,
- update all the historic changes tables,
- find the missing information in order to update the available maps
- obtain the authorization to use the map of the NMA for 3 countries,
- do the necessary editing work,
- obtain the validation of the remaining maps by the NMA,
- post all the validated data on the SALB web site,

A discussion also needs to take place in order to see how we will deal with the territories not yet included in the data set as well as the ones which do not present sub national administrative divisions.

The first stage of the process which should drive us to accomplish these tasks has already started: the UN map library is contacting the NMA of each territory of the Americas in order to update our contact information data set, restart the process where it got stopped (e.g validation of the map) and ask if changes have occurred at the 1st and/or 2nd sub national level since the last contact we have had with them.

We are also hoping that the NMA will be helping us to find the missing information in order to update the maps, and that a solution will be found in order to obtain authorization to integrate the map from the NMA in the SALB data set for the remaining countries.

Building on the successful node that already exists at UNECA for the African continent and in order to support the editing work already performed at WHO, we are currently looking for an institution which would serve as a node for the SALB project in the Americas. The node will be responsible for leading and performing the following technical work:

- Insure the comparison between the list of administrative units received from the NMA and the map at disposal following the protocol prepared for the context of the SALB project
- Look for the missing information or map in order to update available maps and make them correspond to the table received from the NMA
- Perform the necessary editing work in order to obtain the final map to be posted on the SALB web site using the editing protocol generated for the context of the project

The update of the tables as well as the maintenance of the SALB web site will continue to be performed at WHO.

If some resources in terms of staff are already put by the involved institution, additional resources will need to be found. Once the data base up-to-date and a map available for each country, the amount of efforts and resources that will be needed in order to update it each year would be reduced.

4. Conclusion

By looking at providing a freely available, validated, up-to-date and consistent working platform to the international community through a large network starting from the National Mapping Agencies the SALB project is trying to:

- provide information coming from the countries to the international community and not the contrary
- strengthen regional and continental information systems
- reduce the burden on the NMA regarding request for digital maps to be used in the context of thematic mapping exercises offering at the same time the possibility to open new markets for more advanced requests
- reduce duplication of efforts within the UN
- develop data for countries where it did not exist
- add value to other initiative such as Global Mapping and a key element for building SDI(s) by:
 - integrating the time dimension
 - being already seamless (codes, boundaries)

It also provides a standardized process which could be applied to other layers and the possibility to link statistical (e.g. socio-economic) with spatially distributed data (e.g. environment, climate,...) for specific analysis.

As we are living in a dynamic world and as the SALB project has now reached enough maturity, it is now the appropriate time for making the SALB data set reach the present, starting with the Americas, where we are the most advanced, in order to show other regions that this is possible and provide benefits to countries and institutions working at the regional or continental level.

We will not be able to succeed without the support and inputs from the NMA of the Americas. The responsiveness and interest received so far has allowed the project to make tremendous progress these past years and we hope that the NMA will be helping us again in order to achieve this new objective.

Acknowledgement

The authors of this paper would like to take the opportunity of this paper to thank the institutions which have accepted to provide their maps to SALB in the Americas, this includes:

- the International Center for Tropical Agriculture (CIAT) for Bolivia, Costa Rica, Guyana, Honduras, Nicaragua, Peru, Suriname and Uruguay
- the Center for International Earth Science Information Network (CIESIN) for Haiti and Jamaica

- the Instituto Federal de Asuntos Municipales, Ministerio del Interior of Argentina
- the Natural Resources Canada
- the Instituto Geografico Augustin Codazz for Colombia
- the Dirección General de Estadística y Censos supported by the "Proyecto Mitch Clearinghouse USGS - MARN" for El Salvador
- Instituto Geografico Nacional "Tommy Guardia" for Panama
- the Survey and Mapping Department of the Ministry of Physical Development, Housing and Environment of Saint Lucia
- the Caribbean Agricultural Research and Development Institute (CARDI) of the Caribbean Agricultural Science and Technology Networking System for Trinidad and Tobago
- the Department of Commerce, Census Bureau, Geography Division of the United States of America

References

- Ebener S., El Morjani Z., Guigoz Y. (2004): "The Second Administrative Level Boundaries data set project (SALB) A working platform for improving data sharing", Poster presented at the 4th EnviroInfo Conference, Geneva, Switzerland, October 21, 2004.
- Tobler W., Deichmann U., Gottsegen J. & Maloy K., 1995. "The global demography project", NCGIA Technical report 95-6
- United Nations (2000): "Handbook on geographic information systems and digital mapping", Department of Economic and Social Affairs, Statistic Division, Studies in Methods, Series F N° 79

Useful Links

- SALB project: http://www3.who.int/whosis/gis/salb/salb_home.htm
- UNGIWG: www.ungiwg.org
- FAO GeoNetwork: <http://www.fao.org/geonetwork/srv/en/main.search>
- UN Cartographic Section: <http://www.un.org/Depts/Cartographic/english/htmain.htm>

