

SIRGAS2000 – THE GEODETIC REFERENCE FRAME CHANGE AND THE COMMUNICATION WITH THE USER

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Abstract

The advent of new geotechnologies such as the Global Positioning System - GPS and the Geographic Information systems - GIS to supply the opportunity in reducing the data collection and improve the data maintenance. In order to have total advantage of these technologies it is imperative that reference frame of the maps to be used are unified.

There are several impacts caused by the adoption of a new geodetic reference frame in a country and include technical questions involving governmental institutions, on several levels and private companies, moreover, issues more difficult to be understood are involved due to the complexity of the subject and its properties and technical character.

The new reference frame, SIRGAS2000, will solve these problems by supplying a consistent and precise national reference frame for all geospatial applications. IBGE, through the Geodetic Reference Frame Change Project (PMRG) promoted the adoption of the new reference system. It was designed to be more modern, compatible with the most modern positioning technology and with the global positioning systems. With the adoption of SIRGAS2000, the current challenge turns to the combination of the old and new data to supply greater coverage and better use of data; the current challenge is the correct integration of the different set of data.

As part of the SIRGAS2000 implementation (geocentric reference frame), IBGE adopted a series of steps, amongst which stands out the establishment of cooperation with Canada, the University of New Brunswick and other government and private agencies. In the scope of this cooperation it was created the National Geospatial Framework Project - PIGN that searched information on how these impacts will affect the Brazilian users and how to better understand what the users know about the new reference frame.

The PIGN work approached several aspects, from the most specific technical issues up to the concern with the impacts eventually caused by the adoption of the new reference frame. It was also foreseen a working group focused on releasing the geographical

information to the users, and then it was created a communication plan. The main goals of this Communication Plan, developed to give support to the Project, are: To inform all users of the new reference frame benefits, to be officially declared as the sole national geospatial reference frame in 2014, decrease the users community concerns in relation to costs and difficulties on migrating to the new reference frame, to explain the impact of the reference frame change to the affected communities, and on the cartographic documentation, as reference as thematic and explain and demonstrate the use of tools developed for the PIGN project to the affected users.

To take care of these objectives it was created and implemented several communication strategies with the users such as the making of a specialized promotional material, making it public through the presentation of works in events and participation in round tables. Finalizing this Plan, it was conceived a training of informative character and capacity building called "Education Seminars" that are been written and will be starting on the 2nd semester of 2009.

The Education Seminars were planned in a way that the content of each module is adequate to different groups: managers, users and producers and, teachers. For the first group, of managers, the Seminars will be informative, for the users and producers, educative, and for teachers, will for awareness. The proposal for the Seminars is to offer faster and objective answers to those who need to know the subject and /or apply it in their areas of performance.

The modules will contain from the conception of the idea to practical examples, using, in its majority, Demonstration Projects (DPs), which were developed within the PIGN project framework with this purpose. They will also show support tools that can be used in each case, besides news and curiosities on the theme.

The didactic material been prepared should include the presentation slides made during the training, besides the complementary de texts, on the same handout. This material will be good not only for the support of the Seminars but also to other events that will happen later.

The coverage will be national and 8 (eight) Seminars are planned throughout the country in a way that a performance of each one will be done on their respective regions of interest.

With these trainings, the community that uses geospatial information will start counting on a greater number of duly capacitated professionals, and closer to their places of interest, to a more specific support to issues related to the reference frame change. Trained, these professionals will spread the information received and will inform them to other professionals, promoting, this way, sharing of knowledge faster and efficient to the whole community.

1. INTRODUCTION

The Geodetic Reference Change - PMRG in Brazil started in October 2000 under the coordination of Instituto Brasileiro de Geografia e Estatística - IBGE, following a recommendation do plenário do XIX Congresso Brasileiro de Cartography in 1999. Its purpose is to coordinate the Brazilian efforts for the adoption of a national geocentric coordinate system (SIRGAS2000) compatible with the current satellite technology. The project activities include the project and the implementation of a new reference frame system, the addition of more GPS survey control points for later injunction to the classical network, the integration from the classical network to SIRGAS2000, the classical network distortions modeling and the creation of transformation models that take in consideration the distortions.

Together with the PMRG, another project entitled National Geospatial Framework Project¹- PIGN was started in September of 2004 with its due date initially for 4 (four) years. The PIGN overlaps with and provides new dynamics to the PMRG giving support to the technical aspects of PMRG, as well as it is an initiative to understand the impacts caused by the adoption of these systems and to face them proactively.

Several are the impacts caused by the adoption of a new national geospatial infrastructure and include technical issues involving governmental institutions and private companies as well as social impacts related to dealing with individual rights to land and related information, improvement in environmental management and natural resource development, gender equity and native rights, equal access to information for all citizens, improved services, and good governance. Strategies will be developed and applied to assess and monitor some of these impacts relating to:

- a) land reform;
- b) equitable and open access to geospatial information;
- c) access to real equity for women and native peoples;
- d) improvement in good governance for federal, state, and local authorities;
- e) mismatches between national, regional and municipal maps;
- f) transformation of digital data banks;
- g) compatibility between cadastral databases;
- h) delimitation of indigenous peoples land;
- i) improvement in the delivery of utility services;
- j) management and cost of data banks transformation; and
- k) improved environmental management of natural resources.

¹ The *National Geospatial Framework Project* is coordinated by the Instituto Brasileiro de Geografia e Estatística (IBGE) and by the *University of New Brunswick* (UNB) and is sponsored by the *Canadian International Development Agency* (CIDA) through an international agreement with the Agência Brasileira de Cooperação (ABC).

2. OBJECTIVES

To achieve the goals already mentioned previously of elucidation and capacity building of the user community, the Working Group - WG de Advertisement do PIGN elaborated a Communication Plan which served to guide the steps to be dados. In this Plan was foreseen several activities and finalizing with the involved of the Education Seminars.

The PIGN Communication Plan goal is *“To supply information to the Brazilian public on the new geodetic reference frame that is been implemented by IBGE, its impacts and how to mitigate the effects.”* The PIGN Communication Plan objectives are:

- To inform all users of the benefits of the new datum, to be officially declared as the sole national geospatial reference frame in 2014
- To reduce concerns in the user community on the costs and difficulties on the migration to the new reference frame
- To explain the impact of the datum shift to impacted communities, and on the cartographic documentation, as of reference as thematic
- To demonstrate the use of the tools developed for the PIGN project to impacted users.

3. METHODOLOGY

For the communication to exist it is necessary that the transmitting agent has the same language of the receptor agent, otherwise, they will not understand each other and there will be no comprehension and no compromising (MODERNO, 2009). Therefore it is that communication is the process by means of which people acquire comprehension and compromising with change processes. And to give support to the change processes, communication plays two fundamental roles:

INFORMATION - Providing people the information they need to understand the change process and to adapt to the new.

PERSUASION - Positioning the change as something desirable and achievable. The precise measure between information and persuasion depend on the necessities and reaction of the target public.

In each stage, if the work is not done properly it can generate a negative and disrupted vision of the product that is wanted to advertise, generating frustration and loss of time and money.

3.1. The making of a Communication Plan

For the execution of broadcast and advertisement, it was elaborated at the beginning of the Project a Communication Plan by the Canadian partners and later, during the implantation of it, it was adapted to the models and necessities of Brazil. The actual implementation occurred by the Brazilian team always supported and accompanied closely by the Canadian partners.

During the whole process, it was fundamental the actual participation in seminars, conferences, forums, workshops, besides PIGN and PMRG stands in fairs and expositions.

The actions of communication were planed according to the project execution phases, specific for each target public, always making sure that the action performance depended on the resources availability.

Both governments, Canadian and Brazilian, invested resources in the Project, also contemplating communication activities. While the Canadian government was enabling the Brazilian technicians, making possible the Demonstration Projects that would turn to the Project case studies, bought equipments, the Brazilian government, through the Institutions involved, sponsored advertisement in events, necessary trips and the making of marketing material, among others.

Besides the actions of advertisement listed below, there are others related to capacity building and training (Education Seminars) that will be supported by specific broadcasting and advertisement (sending of invitations, review and reproduction of pedagogical and didactic material, creation of certificate, badges, and others).

The responsibility on the supervision of advertisement belongs to the WG of Advertisement, also called WG1.

It was developed as the following basic actions:

- Creation and development of logos to PMRG and PIGN, that will be present in all actions and communication material
- The Education Seminars will have a specific logo
- Inventory de addressees for the making and maintenance of a databank with contacts of the target public (*mailing list*) - managers, producers and users and academia.
- Making of institutional and informative material, like pamphlets, booklets, porters, gifts and digital information
- Stands in fairs and expositions.
- Presentations in specific forums aiming at dar knowledge and capacity building on the subject.

- Promotion of events, lectures and presentations in seminars, conferences, forums, workshops, in institutions and government agencies, com universities, and organizations and entities representing the society.
- Publication of articles in magazines, newspapers and specialized sites of geography, cartography and geotechnologies. And in newsletter of Public Information, in the areas of education, health, among others.
- To define the media to be used to address different levels of the target public and its several levels of knowledge;
- Create a forum for discussions and clarifications
- To produce technical/motivational and institutional videos on benefits and applications.

3.2. Follow-up and Evaluation

The evaluation process is permanent and will developed the following activities:

- Opinion pools on the use, satisfaction and demands not taken care of and writing a report identifying corrective measures and the necessary adequacy
- Application of corrective measures and adequacy of the respective strategies and actions of broadcast and advertisement.
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3.3. Target public

- **Managers** – Are the occupants of direction and management positions of institutions or agencies that use geospatial information.
- **Producers and users** – Are the professionals that produce and/or use data and geospatial information.
- **Academia** – Are the professionals of technical or superior education, of disciplines/courses related to the theme and companies of geospatial technologies development.
- **Organized Society, Citizen and the Press** – at this stage of the project they have not been identified as a target that should be aimed with any type of work since it is believed, in a first moment, that only a more specialized public should be involved.

3.4. Communication Strategies

There are some essential elements to any communication strategy that should be considered:

- A direct effort that starts on the top of the organization – efficient communications need the organization's involvement and support in all levels.

- Consistency on the given message – all communications need to say the same thing. What is said could have a certain degree on details variation, but should be essentially the same message.
- Be carefully planned, detailed and effectively executed – the communication actions are part of the work routine and should be planned and calculated as such.
- Be a coordinated effort in and out of the organization – what is been said inside the organization should be consistent with what is been said outside the organization.
- Should be carefully programmed – it is important to assure that the channels used can fulfill with the compromise at the moment when it is needed.
- Should be multilevel, with the same message elaborated adequately to specific segments of the population – different segments of society have different levels of education, antecedents and cultural issues that dictate how the message should be elaborated.
- Should be oriented to receive feedback – an evaluation on the CHANGE OF THE REFERENCE FRAME is of vital importance and is a important method to measure the success and to feed its development.

3.5. Communication Plan Actions

3.5.1. Opinion Pools

Elaborated through a questionnaire on line assembled and tabulated by the Project technical team. Applied in a very large users universe. It was used the *Diretoria de Geociências* databank of IBGE as well as the Companies Cadastre databank of IBGE (around 60,000 electronic addresses). The Pool was overarching and well tabulated aiming always a friendly interface with the person responding the questions. The number of complete answers was a little expressive but, as thus a report was written that subsidized posterior decisions that helped to define and redirect new and old strategies. Some of the results showed by the questionnaire: user profile, user knowledge on the subject, dataset characteristics, used technologies and expectative of the users.

3.5.2. Internet

PIGN has its own site (www.pign.org) and it is updated at the moment. PMRG is at IBGE's site (http://www.ibge.gov.br/home/geociencias/geodesia/pmrg/default_pmrg.shtm).

In both sites, besides general information of the Project it can also be found several works and presentations that were made during these years.

3.5.3. *Ponto de Referência Magazine*

It has been produced 3 (three) magazines with regularity of 1(one) year. The number of copies was growing gradually from 3000 magazines on the first issue to 7000 on the second and third issues. The magazines have contemplated besides the technical articles related to the technical projects, interviews, questions and answers, communication channels with the users, participation in events. It was always looked for to think on a focus for the magazine with contemporary subject and that it was directly related with the Demonstration Projects that were been held, like the awareness of the new reference frame use by the municipalities on new biddings and the reference frame relation with the environmental and sustainability issues. It was made use of the agencies network of IBGE spread in all national territory to make an ample distribution of that.

3.5.4. Communication Channels for questions and/or suggestions

The Project has also a FAQ on the internet (<http://www.ibge.gov.br/home/geociencias/geodesia/pmrg/faq.shtm>) that answer the more common questions asked by the users. Besides that, it keeps an email of its Executive Secretariat and also from the Advertisement Group (sepmrg@ibge.gov.br and gt1pmrg@ibge.gov.br) that receive the users consultation and questions and try to answer the fastest as possible. Another channel proposed is the “Answer your Questions”, available on the *Ponto de Referência Magazine* where it was looked for to clarify the more common questions that are received through these attendance emails.

3.5.5. Seminars, Workshops and Lectures

There were participation in several Conferences, Fairs, Seminars and Workshops, and Round tables. Several works were presented with debates and clarifications on the subject.

3.5.6. Experience with the Regulating Agencies Workshop

Among the several events that happened, one deserves special mention. Carried through in April/2008, this two-day *Workshop* counted on the participation of 8 (eight) Regulating Agencies of the Federal Government that shared their experiences and absorbed the necessities for the adoption of the new reference frame on their projects and databank. The second day was dedicated to discussions e the elaboration of a document with the event’s RECOMENDATIONS. It was good for the Education Seminars considering mainly the target public of managers that were present. This *Workshop* tried to get government departments to adopt SIRGAS for there own internal and contracted work that involved spatially referenced data collection.

3.5.7. Education Seminars

Throughout the years of 2009 (2nd semester) and 2010, IBGE and its partners, on the scope of Geodetic Reference Frame Change (PMRG) and the National Geospatial Reference Frame Project (PIGN), will start the **EDUCATION SEMINARS** that has as main subject to give knowledge and training on the adoption of the geodetic and cartographic reference frame SIRGAS2000 to groups of users and producers of geospatial information, that should be the “operational arms” of these projects. The first training will be in Rio de Janeiro, where is IBGE’s headquarters and will contemplate all the identified target publics. After that, it will be organized more seven seminars in different regions of the country.

The proposal of the seminars is to give faster and objective answers to whom need to know the subject and/or to apply it on their regions of performance. In coherence with the proposal, the modules have very suggestive titles, such as:

- How to obtain coordinates in SIRGAS2000?
- How to make a mapping in SIRGAS2000?
- What’s the impact on the boundaries with the adoption of SIRGAS2000?

The modules will have from the concept up to practical examples, using, most of the time, the results of the Demonstration Projects (DPs), which were developed to this purpose. It will also show support tools that can be used in each case, besides news and curiosities on the theme.

The didactic material is been prepared and should include the slides of the presentations made during the training, besides the complementary texts, on the same handout. This material will serve not only for support to the seminars but also to other later events.

4. Results

The results reached up to this moment were very positives. Through the elaboration of the Demonstration Projects (DPs) it was possible to have significant experiences for the elaboration of the didactic material that will be made for the Seminars. Besides that, it should be considered also the technical and social benefits that the exchanged experiences provided not only among the institutions involved as, mainly, by the communities and groups involved on the social (quilombolas, indigenous lands and organized associations) and environmental issues. The work on advertisement was fundamental in all this process as, it is a complex theme, of difficult understanding to the majority public.

5. Conclusions

The opinion Pool was significant to confirm some lines of direction that were already been followed and to help on the orientation of new stages. The monitoring needs to be continued through these Pools, however, the work needs to be better directed, it should be invested more in quality and not in quantity. The public to be reached should be more specialized and besides that, it should exist a work of convincing that goes beyond the digital messages. Convincing of the Opinion Pool importance through de direct contact with the user or the differentiated material is fundamental.

Through the work directed also done quite well on the organization of the Regulating Agencies Workshop once more it was confirmed that people need to be contacted in a more direct and personal way. Telephone contacts were essential for the participation of the correct public.

The magazines were the hot spot of the advertisement. Besides the direct mail sent to registered in cadastre users throughout Brazil, the magazines are always very looked for in events that the Project and IBGE are present, besides the requests by email that the Executive Secretariat receives. The material in colour and easy text make it pleasant to read. The fact that current themes were used was also very important to draw attention.

And, finally, the Education Seminars that are been organized. With these trainings, the geospatial information user community will start counting on a major number of professionals dully enabled, and closer to their regions of performance, for a more specific support to issues related to the reference frame change.

This way, it should be achieved the main goal of the PIGN Communication Plan that is **“To give information to the Brazilian public on the new geodetic reference frame that is been implemented by IBGE, its impacts and how to mitigate the effects”**.

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