GIS and spatial analysis in the dissemination of census data

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Antecedents

• GIS are used by INEGI to disseminate census results since 1997
• SCINCE: was the first tool that offer a GIS to the users.
• Designed to disseminate the CONTEO 1995 results
• Nowadays INEGI have different GIS products
Products

• SICAR
  – System of Responsability's Areas Conformation
  – Use of Spatial Analysis to build resonsability’s areas

• Mexico’s’s Digital Map
  – GIS to disseminate the census results
SICAR
The main objective in the census data collection processes is: Ensure the complete territorial coverage.
Inputs

• Data about accessibility collected during the previous enumeration
• Figures concerning to dwellings (non occupied, occupied and temporal) from:
  – Conteo 2005
  – Economic censuses
  – Agricultural census
  – Population's Forecasting
• Procedure’s Test
Field work team

Number of Dwellings

Interview's duration

Accessibility data

Field work duration
Accesibility data

- Accesibility
  - Orography
  - Access Routes
  - Public Transportation
  - Other Access Restrictions

- Scattering
  - Localities scattering
  - Dwellings distributions

- Absence of occupants
  - Number of visits
Estimation of Field work team

- Non occupied dwellings (NV)
- Accessibility's score (IA)
- Interview's duration (DPC)
- Effective time per work day (TEJ)

\[
\text{Carga de Trabajo} = \frac{\text{TEJ dado IA}}{\text{DPC}} = \frac{\text{Viviendas}}{\text{Entrevistador por jornada}}
\]

\[
\text{Número de entrevistadores} = \frac{\text{NV}}{\text{Carga de trabajo * Días de duración}}
\]

\[
\text{Número de figuras siguientes} = \frac{\text{Número de figura anterior}}{\text{Tamaño del tramo de control}}
\]
Desirable characteristics

User

System

Integrity

Homogenity

Contiguity

Compacity
SICAR’s inputs

- Implementing and adjusting criteria
- Geographic DB
- Integrating responsibility's areas to the Geostatistical frame
- Building Work Areas, using simulated annealing
- Implementing and adjusting criteria
- Geographic DB

Vectorial format files

Estimating size of the Field work team

Network of Rural localities

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<tr>
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<th>Nombre_entidad</th>
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Censo de Población y Vivienda 2010

INSTITUTO NACIONAL DE ESTADÍSTICA Y GEOGRAFÍA
Conforming RA
Last planning stage
Outputs
Advantages

- Homogenus criteria to determinate working areas
- Reduction of time and resources to planning the field work
- Produce equititative work charges
Mexico’s Digital Map
August 2010

110,000 users each month

3 millions of geospatial operations

92% are external users

About Digital Map
Digital MAP

- WEB Based Query System
- Makes easy the query and analysis of statistical and geographic information generated by the INEGI
- Designed for all kind of users (experts and non-experts)
Digital Map Design

- Completely developed by personal of INEGI
- Integrated by open source components
- Architecture oriented to Internet and Intranet use
User’s requirements

• In order to design the Digital MAP user’s requirements were considered
• Oriented to improve the user experience
Information included

- 152 vectorial layers
  - 35.5 millions of geographic objects
- 4 Raster
2010 Census information

- **Data about:**
  - 192,244 localities.
  - 2,456 municipalities
  - 32 federal states

- **Soon:**
  - Census track
  - Blocks (restricted use)
Thematics

- Population
- Economics
- Education
- Migration
- Ethnicity
- Physical limitations
Tematic Maps

• Selection of the indicator
  • Selection of the stratification methods

• Different color bar options

• Stratas
  • Color can be selected for strata
Examples of tematic maps
Digital Map Uses

- Users can build buffers around selected objects
- Results may be used to build new layers or can be related to other objects
In this map, we can see an example of how a buffer could be used to establish accessibility areas in the urban case.
Thank you!