Mapping the Media in the Americas: An Innovative Application of GIS

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Abstract

The Carter Center, the Canadian Foundation for the Americas (FOCAL) and the University of Calgary (UC) have established a joint project to map media concentration in the Americas and draw the attention of governments, citizens and the media themselves to the dilemma of political finance.

To promote transparency in elections and democratic politics, the Mapping the Media in the Americas project aims to utilize the functionality of a Geographic Information Systems (GIS) to map the media and analyze spatially the pivotal role of the media in political finance in 12 countries in the Americas. Various datasets (media, election and census) from each country will be organized geographically in a GIS for visualization purposes, and GIS techniques such as proximity, overlay and geo-statistical analyses will be performed to better understand the associations and patterns within these disparate datasets.

Once created, the maps will be a tool for the development of political parties and public education, among other uses, and will draw increased attention to and support reform of political finance laws and practices. Reform, in turn, will lead to decreased corruption and more equitable access to political information during elections. This is a working document that will evolve as further research and exploration of the political and social data is conducted.

Introduction

GIS methodologies such as mapping and analysis, spatial modeling, visualization and spatial statistics are important and valuable tools in understanding the nature of, the relationships with, and the interactions between many variables. In this case we will be using them to explore the relationships between the media and campaign finance in the Americas.

Using the visualization techniques afforded by a GIS, the Mapping the Media in the Americas project will seek to engage media professionals – owners, editors, columnists and journalists – in efforts to improve campaign and party finance practices. We hope to explore with them, and with the government, political parties and civil society leaders, the lines of influence that the media has in shaping the campaign finance environment. This includes degrees of monopoly and competition that affect pricing and diversity of political advertising, as well as the variety of news sources available to voters because many radio and television stations within conglomerates all draw on the same news feed.

The issue is a complex one, and all the more so for citizens who are not media specialists, and it requires careful balancing of values such as fairness and freedom of expression. What reform advocates need is a new tool that can illustrate graphically how media networks are concentrated and what the consequences are for electoral politics so that citizens and leaders in each country can be empowered to decide what media and campaign finance regulations are appropriate for them. For this purpose, the Mapping the Media in the Americas project is harnessing the capabilities of GIS technology to contribute to an understanding of the influence that the media has in shaping the campaign finance environment.

The Problem

Over the last 20 years the Western Hemisphere has made substantial progress toward democratic governance, with every country except Cuba and Haiti currently represented by an elected national government. The main challenges to democracy now are "second generation" problems such as corruption, weak party systems, inclusion of marginalized groups, and presidential dominance of other branches of state.

In Latin America particularly, the prevalence of such problems has combined with persistent poverty and inequality to erode public confidence in democratic institutions – so much so that a 2003 national Latinobarometer poll found that a substantial minority of Latin American citizens would trade a democratic government for a non-democratic one if it would solve their economic problems.

Political finance is one second-generation problem that has received increased attention in recent years. Democratic governance requires money to pay for election campaigns and party development between elections. The central dilemma in the political finance issue is how to assure that sufficient money is dedicated to fostering competitive elections and well-developed political parties, while preventing undue influence on – or outright capture of – the political system by wealthy private interests.

While this issue poses difficulty even to developed democracies such as the United States and Canada, it is particularly acute in countries where underdevelopment places limits on the

government's ability to finance politics from the national budget – which leaves private finance as the main source of political funds. Compounding this already complex problem is the fact that, in much of Latin America, many political parties' and candidate's access to the powerful and influential mass media during campaigns is uneven and can bias results.

There is a growing concern that mass media outlets – the majority of which are weakly regulated, for-profit businesses – are profiteering on elections, charging high prices for advertising slots and delivering advantage to wealthy candidates. The resulting perception is that the media are acting as "kingmakers," determining which candidates will be successful by promoting their campaigns through discounts on advertisements and preferential news coverage.

Additionally, the media outlets in Latin America are increasingly concentrated in the hands of a few owners, be they families or corporations, which makes independent news increasingly difficult to find. Some media are, in effect, oligopolies. Where competition is constrained and media choices are limited, citizens have no opportunity to compare reports for accuracy, and voters may only hear the names of candidates enjoying the support of media owners and editors.

Uneven access to television by candidates and parties in Latin American elections is of special concern because Latinobarometer surveys show that in most countries the public trusts television more than the legislature, the courts, and sometimes the presidency. What makes this fact particularly worrisome is that the vast majority of this same group may be entirely unaware that their local television, radio and cable channels are networked into a single conglomerate – and may wrongly believe they are receiving information from a variety of sources.

The Project

In an effort to reduce corruption and promote equitable access to political information during elections, the University of Calgary, the Canadian Foundation for the Americas (FOCAL) and The Carter Center have partnered for a three-year project to 1) electronically map media access and ownership in a dozen countries in the Western Hemisphere and 2) use the map as a tool to empower policy-makers and the public to facilitate constructive reforms of political finance laws and practices regarding media access.

Concrete data on existing television, radio, and newspaper ownership structure, their broadcast/circulation range, viewership/readership, news sources and editorial lines or political affiliations will be collected. The University of Calgary will then use GIS technology to create a digital map that layers the collected data on the media over a territorial map of each country's electoral districts – showing exactly which news and political advertising sources reach which voters. The addition of information of electoral results, demographic and socio-economic information will help map users to visualize the connections between media publicity, electorate profile and voting patterns.

The map, which will be "virtually" housed and easily accessible on the Internet, will also illustrate connections between media ownership and the networks to which they belong, making evident at a glance if some portions of the country are served by only one media owner or news network or are served by multiple media outlets with the same political affiliation. Because the map will be interactive, users will be able to click on a specific country or area and bring up a wealth of additional information on many related issues such as regulations governing use of the

media during campaigns, civil society groups' estimates of the value of political advertising on a television station, and contact information for community groups within the country working to reform campaign finance. Once it is completed, the maps in each country will be sustained through alliances with local groups trained in GIS, which may include government agencies, universities and civil society organizations.

But the completion of the map is just the starting point of this project. In an unprecedented move – no other non-governmental organization working on campaign finance reform has tried to engage them before – the partners will meet with the media owners, editors, and journalists to preview the map, confirm its accuracy, explain its implications for fair campaigns and party development, and urge them to practice corporate social responsibility. This is an important part of the project because by including them in the effort to explore potential reform ideas these influential gatekeepers may signal which government reforms they may be willing to support and which elements of self-regulation they might adopt.

Then, with this new resource in hand, the partners will begin meeting with government officials, electoral and judicial authorities, and legislative leaders to discuss how media access is perhaps the most important component of campaign and party finance and, specifically, to convey potential media-supported reforms and urge implementation and enforcement of laws and policies that allow for equitable access to the media.

The Impact

Democracy depends on a knowledgeable citizenry whose access to a broad range of information enables them to participate fully in public life. And one key to creating an informed electorate is to allow equitable access to the media by all candidates and political parties during a campaign, not just among the ones who can afford it.

By creating a tool that graphically illustrates and helps untangle the complex web of Latin American media ownership, this project will raise public awareness of the lines of influence that the media has in shaping the campaign finance environment. Because this resource will be presented as a form of assistance, not criticism, when consulting with media owners, policy makers and others, it will encourage social responsibility among the media while also empowering government officials to implement and enforce policies that require fair media access during election campaigns and between them.

When completed the media mapping project will become a powerful tool in an organized effort to reduce corruption and other second-generation problems facing the democratic process in the Western Hemisphere. Electoral authorities have indicated that it will be useful in determining which media have sufficiently broad reach to carry public education messages concerning registration and voting. Moreover, information on the map indicating programming by small media in indigenous languages can help election authorities' efforts to improve inclusion of marginalized populations in the voting process. For their part, scholars see the map as a starting point for designing studies of the impact of publicity on voting patterns. Additionally, in many countries political parties are new and weak, and face substantial hurdles in recruiting members and strengthening their connectedness to the base of voters. The map can help by providing parties with information to plan their media strategies to target populations that are currently not voting or are swing voters, and to identify media that reach districts where the demographic

profile of the eligible voter population seems a good match to the party's political program. Even the private sector may find the map useful in marketing. But most importantly, the resources established during this project will help governments to design political finance laws and regulations that assure equitable access to the media, which in turn will help reestablish their faith in democracy as the best form of government.

An Innovative Application: The Use of GIS and in the Social Sciences

Over the past two decades, the analysis of place and space has become an essential component of social science research (Soja, 1989; Gieryn, 2000; Crabtree, 2003). With the advent of sophisticated technology and new methodologies of spatial analysis (such as geographic information systems, global positioning systems, remote sensing, and spatial statistics), social scientists are paying increased attention to location and spatial interaction in theoretical frameworks (Goodchild, et al., 2000).

Space is an integrating theme across various social science domains. Economists study economic processes, demographers study population characteristics, and political scientists study political institutions and behavior; to a large extent each social science exists in isolation from the others, examining its own piece of the social pie. The new "spatial social science" (CSISS, 2004), has generated much interest in GIS and in what it makes possible: location can integrate these disparate pieces of social information and facilitate the interpretation of social processes. At specific places and times economic, demographic, political and other social processes are combined and interact, and the implementation of GIS and spatial analysis can provide the key to this interaction (Goodchild, 2004).

The application of GIS analysis has been increasingly applied in an effort to better understand and respond to a variety of political and social problems. However, never before has GIS been used as a tool for examining political finance. Literature on mapping and spatial analysis of political process in countries other than the USA is limited, but as information becomes readily accessible the potential and relevance of GIS applications for understanding the political processes in different countries cannot be ignored.
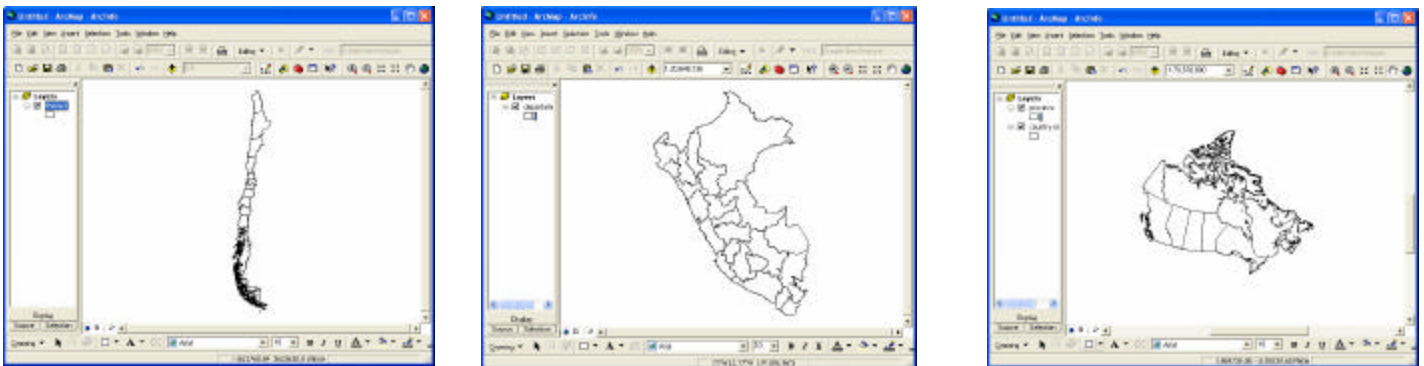
Applying the GIS: Preparing to Map the Media

The creation and application of GIS provides a rich research tool to visualize, explore and analyze spatial relationships. In order to make the Mapping the Media in the Americas project a success, an organized collection of computer hardware, software, geographic data, and personnel need to capture and display media publicity, demographic statistics, electorate profiles and voting patterns for each of the dozen selected countries.

The University of Calgary utilizes ESRI's ArcGIS 9.0. This integrated collection of GIS software products will build a complete GIS for the Mapping the Media in the Americas Project. ArcGIS enables users to deploy GIS functionality wherever it is needed – at this stage ArcGIS Desktop GIS software products are being used to compile, map and analyze geographic information from the countries at the University of Calgary.

The GIS conceptualization for this project considered two different routes: to make use of existing available data sets, or to start from scratch. In most cases the latter scenario is not an economically justifiable approach because of the time and costs associated with data collection and capture e.g. digitizing, scanning and data entry. The former, however, requires that we know what data sets are available from each country; whether they can be used; what costs are involved; and above all whether they are of the right spatial scale for the intended application. Since many Latin American countries are using GIS, an excellent spatial data infrastructure is currently being created.

The emerging GIS infrastructure has aided project development considerably, and countries are selected based on a number of different criteria, the most important of which are the level of development and use of GIS technology in the country, and the availability of GIS compatible data. After assessing the countries capabilities to the extent possible via interviews and Internet searches, members of the project team traveled to the selected countries to obtain GIS data for the project. To date, both spatial and tabular data (election results, census and media information) has been collected for Peru, Guatemala, Chile and Canada.

Figure 1: Basic Spatial Data for Countries Currently Being Mapped

One of the strongest arguments for looking at the dilemma of political finance through a spatial lens - through maps and spatial analysis - is that it provides observations with context: processes can be examined in their geographic settings.
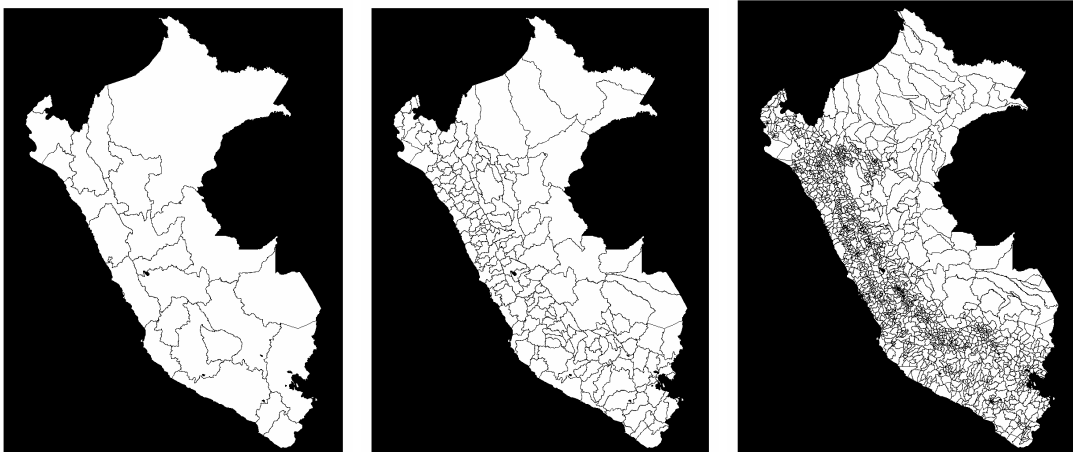
Among the spatial and tabular data being collected and mapped are:
- Base maps
- Maps of electoral boundaries
- Number of registered voters per electoral district
- Ratio of male and female voters per district
- Results of previous elections by electoral district
- Location of media outlets (Radio, TV, Newspapers, Cable)
- Reach/coverage of radio and TV
- Circulation of printed press
- Internet use
- Population density
- Income level
- Literacy rates
- Language

The GIS will help answer specific questions about these variables and perform the following functions:

- generate "thematic" maps (ranged colour maps or proportional symbol maps to denote the intensity of a mapped variable);
- allow for overlaying of different pieces of information;
- create buffer areas around selected features (eg. a radius of 10 km around a radio tower to denote a broadcast range);
- carry out specific calculations (the proportion of the rural population falling within a certain radius of a TV satellite receiver);
- calculate distances (e.g. the distance of a rural community to an internet provider);
- permit a dynamic link between databases and maps so that data updates are automatically reflected on the maps;
- permit interactive queries of information contained within the map, table or graph;
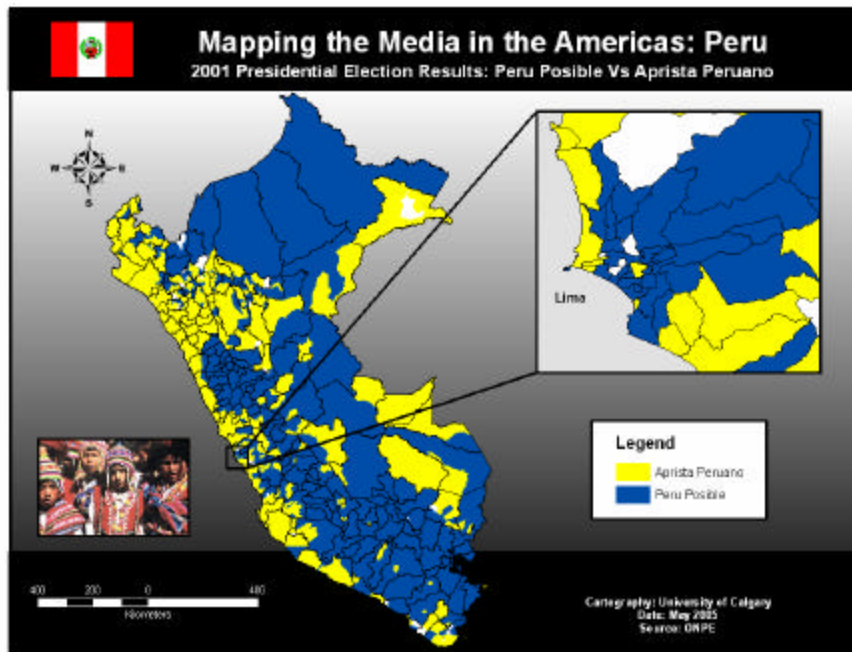- perform spatial correlations between variables

The spatial data made available by the selected countries has provided the base maps and the level of analysis for the Mapping Media Project. Peru, for example, has three divisions representing the different levels of political administration: the departmental, provincial and district levels, with the latter being the finest area of division and level of analysis. For each district in Peru, the Mapping the Media in the Americas project has acquired election and census data.

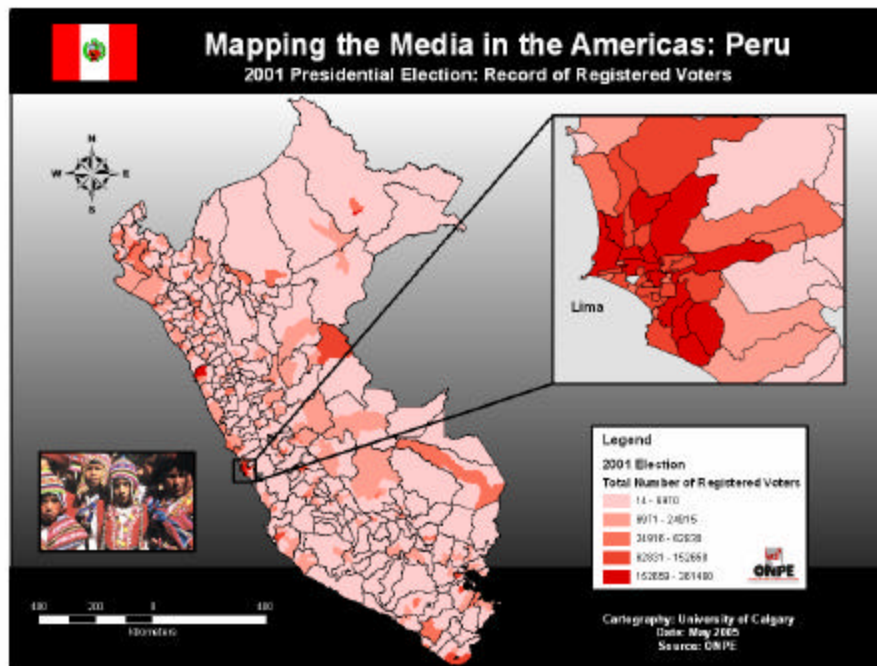**Figure 2: Levels of Analysis: Spatial Data of Departments, Provinces and Districts**

The GIS will perform a number of functions depending on the type of data available. Primary for this project is GIS' ability to map layers of information and display their distribution across the country as this allows patterns to emerge: people, places, objects, and events are spatially distributed and this visualization enables users to see what is happening in certain areas and where to take action. For example, in the figures below we are able to visualize political parties with the majority vote in each electoral district, location of media outlets, geographic division of census tracts, etc. Figure 3 displays the two Peruvian political parties that competed and won the majority vote in the last national election: The 2001 Presidential Election.
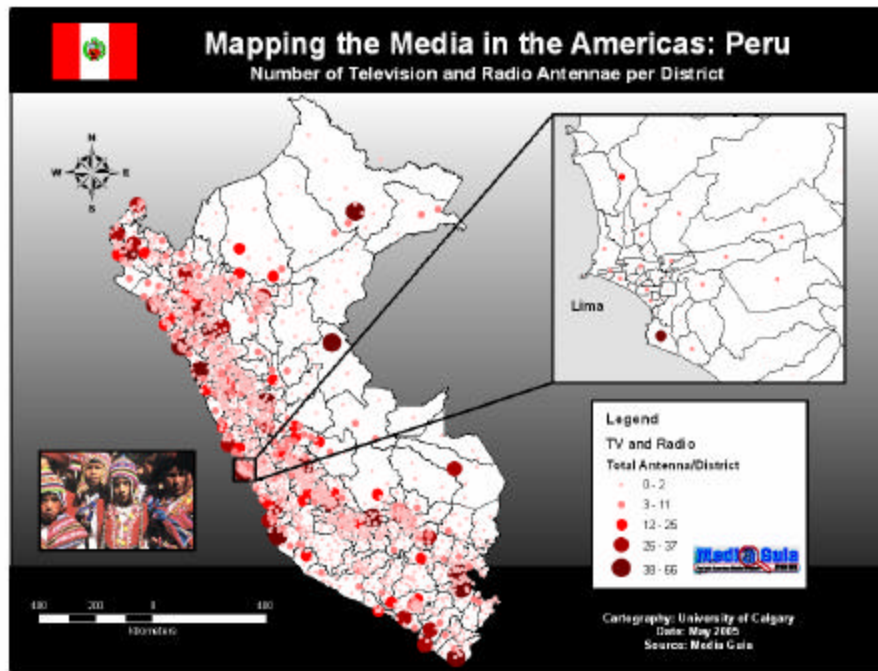
Figure 3: Mapping the Winners: 2001 Peruvian Presidential Election Results

Further refinement of the collected data from each of the countries will provide the ability to map quantities, such as the location of the registered voters, where the most and least radio stations are broadcasting, to find places that meet certain criteria, or simply to see the relationships between places. This gives an additional level of information beyond simply mapping the distribution of people, places and events. The following maps (figures 4 and 5) display the number of registered voters for each district and the number of media outlets for each district respectively.

Figure 4: Mapping Quantities: The Location and Number of Registered Voters

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Figure 5: Mapping Quantities: Location and Number of TV and Radio Broadcasting Centers

Associations will be seen as to which districts have a greater number of voters and if these districts are being adequately served by a variety of media outlets. In addition, comparisons can be made between the number of registered voters and the number of people who actually voted in the most recent election.

Mapping density is important as while concentrations may be seen by simply mapping the locations of features, in areas with many features it may be difficult to see which areas have a higher concentration than others. Mapping density is especially useful when mapping areas, such as census tracts or electoral districts, which vary greatly in size.

Further information may be added, such as the location of rural and urban areas, levels of education, poverty indicators – overlaying the disparate layers of social and political information provided by each country enhances the interpretive utility of the maps by including information that is helpful in understanding the nature and distribution of variables related to campaign finance. It also provides a means of developing models for exploring data trends and testing hypotheses about the possible underlying relationships between media publicity, electorate profiles, voting patterns and campaign finance. Important questions are raised: for example: Which areas have a certain demographic makeup and what has been their voting pattern for the past 5 years?
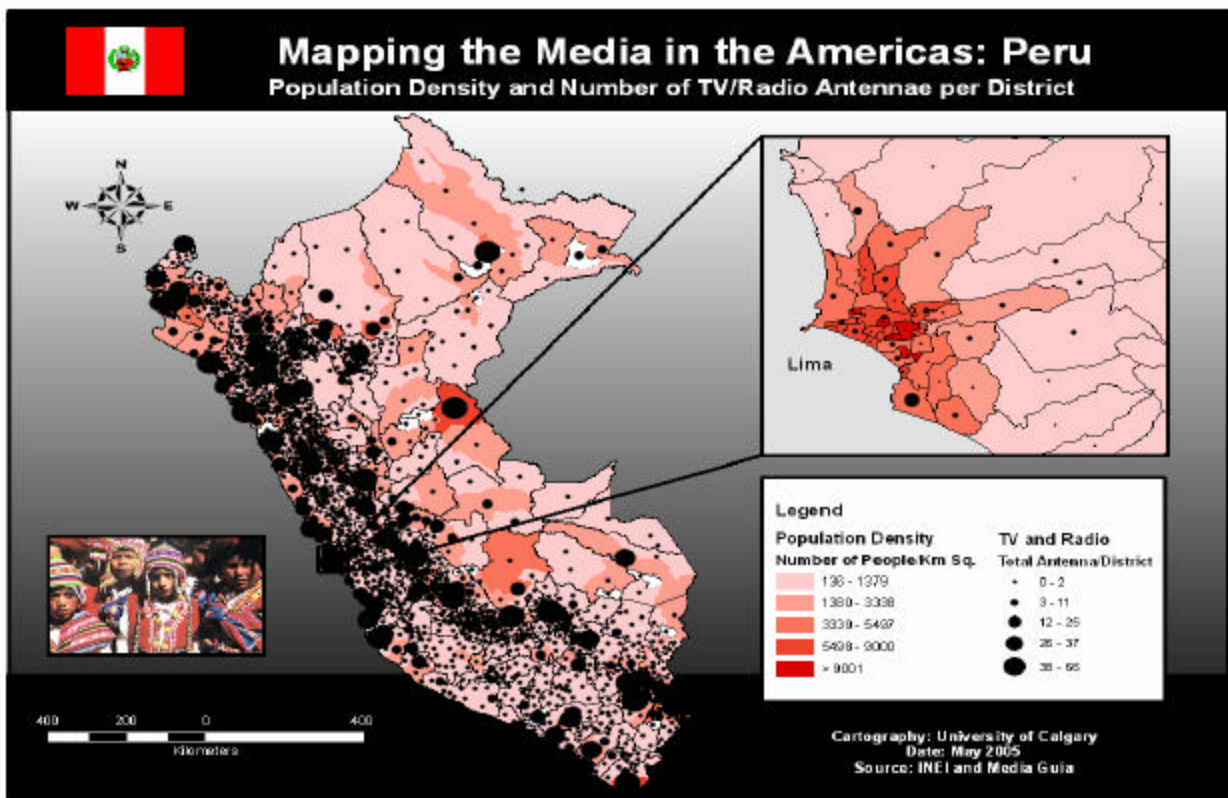
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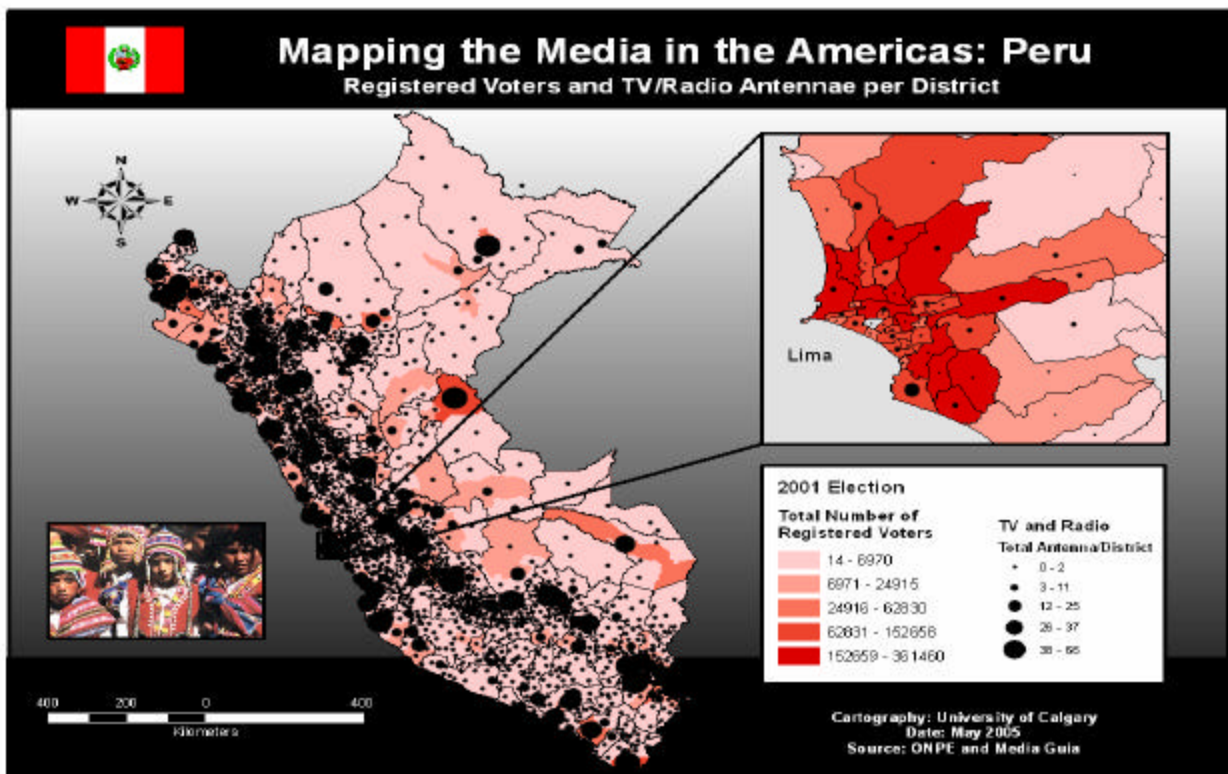**Figure 6: Illuminating Trends: Population Density and Media Outlets**

Figure 7: Exploring Relationships: Registered Voters and Media Outlets

In addition to the data visualization provided by the thematic and attribute maps, exploratory spatial data analysis (ESDA) techniques will also be utilized to explore the patterns and relationships within the different datasets. The use of local and global spatial statistics (e.g., Local Indicators of Spatial Association – LISA statistics, Geographically Weighted Regression), as well as confirmatory data analyses techniques that explicitly incorporate spatial relations in modeling (e.g., Spatial Regression Modeling) will provide quantitative insight into the social and political processes at work in these countries.

It is important to note that there will be gaps in the data: political boundaries are changing, new districts are being created or others merged, census collection may not match precisely with the political administrative boundaries and media outlets are in a constant flux – public and private media continuously change ownership, expand circulation and increase/decrease broadcast range. However, one of the great advantages of using GIS technology is the ease with which the data can be modified and information can be added. Once completed, the maps will be continuously updated and new and emerging data will be added by in-country organizations that will take over the long-term maintenance of the maps.

Additional GIS capacities yet to be developed

Of great importance is the functionality to map change within and between these countries. The GIS will map the change in a country or an area to anticipate future conditions, decide on a course of action, or to evaluate the results of an action or policy. By mapping where and how things move over a period of time, insight is gained into how processes operate and to anticipate future needs. For example a political analyst might map the change in voting patterns before and after a presidential election campaign to develop a hypothesis about where campaign advertisements were most effective.

Why this matters

The integrative and applied natures of GIS technologies make them attractive to many social scientists. Indeed, GIS offer an important means of understanding and dealing with some of the most pressing problems of our time, be they local or global concerns.

The paucity of GIS for a project of this nature is twofold. Today, there is an endless volume of data that can be integrated into maps (i.e., demographics, vote history, surveys, socio-economic variables). On a map vital spatial patterns and relationships are apparent, whereas in database format, they may be hidden in a sea of tables and text. Secondly, quantitative analyses can be carried out on the datasets, looking for statistical significance within and between the disparate layers of information. Ultimately voter demographics and social trends can be analyzed with other statistics to create maps that help plan, manage, and visualize election processes such as media publicity, campaign expenditures, election results and electorate information.

The countries in Latin America are in a unique position to show us something about the dilemma of political finance in different regional contexts. The various countries have experienced economic reforms, varying levels of political stability and the growth of communication and technological infrastructure. Political finance systems across the hemisphere are diverse, and may include models of effective regulation. In Chile and Brazil, parties and candidates may not

purchase television advertisements beyond those given by the governments, whereas in Venezuela media was regulated only by a temporary negotiated accord during the 2004 referendum. Both Canada and Mexico require parties to use at least 50 percent in public finance, but parties in Guatemala and the United States rely almost entirely on private financing. Such diversity is welcome; each country should develop its own political financing system suited to its own particular population, demographics, electoral system, media ownership structure and cultural values. The project will make key elements of the political finance system evident to citizens so that they can contribute constructively to evaluating their own policy.

The Partners

A collaborative approach to the media mapping effort is important because each partner brings specific expertise and experience to the project that is critical to its overall success. The Carter Center, founded by Jimmy and Rosalynn Carter in 1982, is a non-profit, non-partisan, non-government organization (NGO), dedicated to preventing and resolving conflicts, promoting sustainable development and human rights, enhancing freedom and democracy, and improving health. The Carter Center is a convening authority on the issue of financing democracy in the Americas. Through its strong relations with governments, access to the highest-level government officials, and contacts with media owners in the region, The Center has the ability to convey project findings as well as the visibility necessary to promote the use of this innovative tool at both regional and national levels.

The Canadian Foundation for the Americas is an independent, NGO dedicated to deepening and strengthening its country's relations in Latin America through policy discussion and analysis. FOCAL has an extensive network of contacts in the region and will serve as the lead agency coordinating the development of the map. FOCAL, in conjunction with regional civil society organizations, will also be responsible for organizing the local and regional public education seminars and political party workshops.

The University of Calgary, recognized as one of the leaders in GIS technology, will be responsible for all technological components of this project from design and digitalization of the map to training of the OAS officials on how to update and maintain it. The OAS, a multilateral member organization that works to promote good governance in the Western Hemisphere by reducing corruption, is in discussions with The Carter Center to allow its Office for Promotion of Democracy to take over responsibility for the map once the project is completed. In addition, the University has dedicated its top faculty in the area of media and political finance to consult on this project.

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