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Session Six

Gilberto Calvillo-Vives
President of INEGI, México.

Spatial Data Infrastructure: A framework for Climate Change Statistics

Climate change is better understood considering earth as a complex system whose components are several “spheres”. The traditional ones, Atmosphere, hydrosphere, lithosphere and biosphere, plus two other that are specially relevant for climate change: Anthrop-sphere and exosphere. The first one deals with human activities that impact the environment and the later deals with the solar system; mainly with the Sun as source of most of the energy that sustains life on earth. Except for the exosphere, all spheres are subsystem of the complex system Earth. In fact exosphere is a system that contains Earth as an open subsystem which receives a constant flow of solar energy.

A multitude of processes take place on system Earth. Among them the ones that are directly responsible for climate change. These processes can be classified in two categories: The ones that have been evolving since the origin of the planet and those of anthropogenic nature. For a long period human activity on earth have a negligible impact on the environment. However in recent history, population explosion and industrial development did affect the natural processes, as shown by different studies. The dynamics of System Earth is determined by the processes that take place in each one of the “spheres” but also among them. The information to describe the state of the system comes, at great extent, from the geographical sciences. To deal with the big number of information producers and the huge amount of data involved in the description of territory and its features geographers have developed the concept of Spatial Data Infrastructure (SDI) which is a systemic approach to the gathering, organization, dissemination and use of geographical information

The present concern for the environment has prompted United Nations and some other parties to promote actions to mitigate environment deterioration which leads to global warming. In order to assess the effectiveness of the actions taken, it is important to understand the dynamics of the system Earth and to be able to measure some of the more relevant variables in the processes. Increment of greenhouse gases is only one among many other. The general framework to deal with the statistical characterization of system Earth, its state and the assessment of the actions taken is the so called Pressure – State – Response (PSR) model.

In Mexico official statistical and geographical data is produced by the National System of Statistical and Geographical Information (NSSGI). The system is organized in three subsystems: the one in charge of demographic and social information, the one that

deals with economic information and the one that deals with geography and the environment. This last subsystem uses as frameworks the spatial Data Infrastructure for geography and the PSR model to address environmental problems.

In this talk we will show how the SDI is being constructed and how it naturally can encompass the indicators used in the PSR model. Also, some examples about the use of this SDI will be presented.