



EOSDIS Earth Observing System Data and Information System

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Population Data and Global Environmental Change [1]

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In 1991-92, the Human Dimensions of Global Environmental Change Programme (HDP) of the International Social Science Council charged its Working Group 3 on Demographic Data to inventory demographic data currently available; evaluate their adequacy for global environmental change research; recommend improvements in currently available data; and consider additional types of demographic data that may be needed. The resulting report highlighted the need for different databases at different levels of spatial resolution (as high as 1 square kilometer), the importance of developing time series data at the different resolutions, and the desirability of unrestricted distribution of these data sets for scientific purposes. The report specifically recommended efforts to make available an existing georeferenced population database developed by the U.S. Bureau of the Census for the U.S. Department of Defense and other intelligence agencies.

In response to this report and related calls for improved population data, the Consortium for International Earth Science Information Network (CIESIN) undertook a global demographic data project to develop a suite of georeferenced population datasets at varying levels of resolution. One major initiative was to negotiate with the U.S. Bureau of the Census and the relevant defense and intelligence agencies to clarify the unclassified status of the existing database and to arrange for its public release. This Global Population Database can now be ordered from the Socioeconomic Data and Applications Center (SEDAC) at CIESIN and includes gridded data for 107 countries. The database includes estimated and projected population totals for urban agglomerations and rural areas with resolution of 20' latitude by 30' longitude in developing countries and 5' by 7.5' in developed countries. These data may be imported into a geographic information system (GIS) such as ArcInfo using a spatial data set such as Digital Chart of the World.

CIESIN has also worked with the National Center for Geographic Information and Analysis (NCGIA) at the University of California at Santa Barbara to develop a more comprehensive and consistent Gridded Population of the World data set using GIS methods. This data set includes gridded population values for 5' by 5' quadrilaterals for the entire globe, in both "smoothed" and unsmoothed forms. The smoothed version is based on the "pynophylactic" algorithm developed by Waldo Tobler of the NCGIA, which is designed to reduce discontinuities at administrative boundaries yet preserve the population totals for each defined administrative unit. This data set is also available via SEDAC, and technical documentation has been published by NCGIA (Technical Report 95-6).

Higher resolution population data are clearly needed to link with the data resolutions available from remote sensing platforms. CIESIN therefore undertook to develop new data sets for selected countries such as the United States and Mexico, which could, for example, be matched with the Seasonal Land Cover data set under development for North America by EROS Data Center. A set of georeferenced population data sets for Mexico has been developed which includes a 1-kilometer GIS coverage based on the 1990 Mexican census and a time series data set of urban population for 1921-1990. For the U.S., SEDAC is developing a set of data and tools for interactive "browsing" of gridded population data linked with gridded remote sensing data. As one by-product of this effort, SEDAC has made available a file transfer protocol (ftp) archive of boundary and Census data that greatly simplifies access to key portions of these data sets. A multi-layer interdisciplinary GIS of Rwanda has also been developed by Michigan State University in collaboration with CIESIN and others; unfortunately, distribution of the population component of this database has been restricted by the new Rwandan government. For further information on the availability of these products and services, please contact SEDAC user services.

Continued development and dissemination of demographic data products of the type described here are high priorities for SEDAC and the research community concerned with human dimensions. Such data are applicable to a range of studies such as analyses of pollution emission distributions and time variations, assessments of potential impacts of and vulnerabilities to environmental change, and efforts to account for human influences on natural science observations. As noted in the 1992 HDP report, "rarely have we seen such a clearly expressed need from the scientific community." In this spirit, SEDAC continues to develop linkages with key organizations

Feedback

and individuals with relevant data, experience, and skills.

Reference(s)

Clark, J. I. and D. W. Rhind. 1992. *Human Dimensions of Global Environmental Change*. Programme Report 3. International Social Science Council and UNESCO.

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