

Description of Gecon 2.11

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In the GEcon2.11, we made the following major changes:

1. GCPMEROil and GCPPPPoil were adjusted according to the EIA oil production and price. For the countries that are in Bakur's original data but not in the previous Gecon files, the new GCPMEROil and GCPPPPoil were generated according to Bakur's data. The previous Gecon files had mistakes for three countries. The oil GCPMER from Venezuela were mistakenly placed in U.S. cells; oil GCPMER from Syria were mistakenly placed in the Sudan cells, and oil GCPMER from Norway were mistakenly placed in Niger's cells. These mistakes have been corrected in Gecon2.11. Accordingly, we updated GCPMER and GCPPPP with new oil data.
2. We merged new GCPMER and GCPPPP with the GPW world grid population (generated from data at the 2.5-minute resolution) for 1990, 1995, 2000, and also rescaled the grid cell population (GPWPOP) with the World Bank national population data for 1990, 1995, and 2000. Next we calculated 1990 per capita GCPMER and per capita GCPPPP for 1990. Using GPWPOP 1990, 1995, 2000 data times per capita GCPMER and per capita GCPPPP (1990), we created GCPMER and GCPPPP for the three time periods.¹
3. Around 2600 cells in Gecon2.11 have GPWPOP (generated from 2.5-minute resolution data) larger than 0, but equal to 0 in previous Gecon files. They are either mistakes or very low density areas. Most of them are in Northern Ireland, Mali, Canada, Russia, Australia, and Greenland. For

¹ Population data in single country files does not perfectly match with population data in the GPWPOP in GEcon2.11. This is because population data in Gecon2.11 is generated from the 2.5 minutes world population image, while the population in single country files is generated from the 2.5 minutes image of each country. Although both images are from GPW, the pixel values from the two images for the same geographic location are not always a match. The error tends to be larger around country borders.

these cells, the per capita GCPMER and per capita GCPPPP are missing. We used their national per capita MER and per capita PPP values in all calculations instead of their per capita GCPMER and per capita GCPPPP.

4. Next, we summed GCPMER and GCPPPP for 1990, 1995, 2000 at the national level, and took a rescaling ratio of World Bank national data to the summed national total. Applying these rescaling factors to the cell values, we obtained the rescaled GCPMER_2.11 and GCPPPP_2.11 for 1990, 1995, and 2000.
5. We used a rescaling ratio of 1 for the countries whose population data were missing in the World Bank data. For those countries that did not have GDPMER and PPP from the World Bank, we set their rescaling factor for 1990=1, but left their rescaling factors for MER and PPP in 1995 and 2000 as NA.
6. We also updated the following individual country's data – Angola, China, U.S., and Vietnam. For Angola, China, and Vietnam, we derived new data from the better provincial population and GDP data. For the U.S., the calculation was based on the county-level population from the U.S. Census and the county-level GDP that we estimated from metropolitan and nonmetropolitan GDP data provided by the U.S. Bureau of Economic Analysis. For detailed calculation, please see the description of method on the individual country page.
7. Gecon2.11 also includes 15 variables of the grid cell mean luminosity. NOAA DMSP-OLS Nighttime Lights Time Series (version 2) provides the luminosity data at 30 arc second grids, spanning -180 to 180 degrees longitude and -65 to 65 degrees latitude from four different satellites. We downloaded the images of raw avg_vis from 1992 to 2003, which contains the average of the visible band digital number values ranging from 0-63. We then generated new values of 1.5 power of the pixel values and averaged them at the 1 degree grid cell level.

8. We added a new Rig variable in Gecon2.11. GPW V3 provides the world national boundary shape file compatible with its 2.5-minute population raster file. We divide the number of pixels within one 1 degree grid cell by 576 and obtained the estimates of the share of land within grid cells. Compared to old Rig in the previous versions, GPW_RIG provides more accurate numbers for small islands.