New map tool identifies patterns of racial diversity across the US

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Researchers Anna Dmowska, a postdoctoral fellow for UC's Space Informatics Lab, and Tomasz Stepinski, the Thomas Jefferson Chair Professor of Space Exploration at UC, developed a large-scale mapping technique to track a variety of demographic data across the United States. Credit: Colleen Kelley

University of Cincinnati geography researchers have developed a large-scale mapping technique to track a variety of demographic data across the United States, including researching populations based on gender,

race and economic diversity. Details on the technique behind the new, high resolution, grid-based map of U.S. demographics developed by Anna Dmowska, a postdoctoral fellow for UC's Space Informatics Lab, and Tomasz Stepinski, the Thomas Jefferson Chair Professor of Space Exploration at UC, are published in this month's issue of *Applied Geography*.

The map can also be found online at http://sil.uc.edu/webapps/socscape_usa/.

The model was created starting with demographic maps of the U.S. from the Socioeconomic Data and Applications Center (SEDAC) at Columbia University. The SEDAC maps factored data from the 2000 U.S. Census. The UC researchers then used a technique called dasymetric modeling to sharpen the SEDAC grids into higher resolution (90 m) maps that can indicate changes in demography with much higher accuracy than the 500 m grid size of the SEDAC maps. Using additional satellite information from the 2001 National Land Cover Dataset (NLCD), the researchers could identify areas reflecting population density, as well as urban, wooded, open space or agricultural areas.

"In the past, a similar technique has been applied to a single city or county," says Stepinski. "We've now been able to apply this to the entire United States. From a research perspective, this allows us to easily see the makeup of a population from the small scale of a neighborhood to the very large scale of the United States. The demographic data is attributed to areal units the size of a stadium; about 3 billion such units are needed to cover the entire United States."

By combining some of their high resolution maps, those pertaining to race and ethnicity, the researchers constructed a single map reflecting racial diversity. The racial diversity is represented by 33 different categories including, for example, "white-dominated, low racial

diversity" (indicating significant minority of race other than white), "black-dominated, medium diversity" (indicating significant minority of race other than black), or "high diversity" (indicating lack of a dominant race among residents), which, as Stepinski points out, is rare in the U.S.

Stepinski adds that in his own exploration of the map, he found that new neighborhoods accommodating growing populations in the South are reflecting increasing racial diversity. Stepinski says the map also clearly illustrates racial divisions that persist in many large American cities. He says one particularly striking example is the racial divide along the northern edge of Detroit where the map shows 8 Mile Road sharply dividing the black-populated, economically depressed area of the city from the more affluent, white-dominated suburbs.

The web tool incorporates Google street maps for reference and provides immediate information about a racial makeup of any local neighborhood within the U.S. With its 33 categories and 90 m resolution, Stepinski says the map is the highest resolution map of racial diversity across the entire U.S. available to the public.

Stepinski says the maps can also identify populations at risk from natural hazards (drought, flooding and fire, for example) and can serve research fields including sustainability, environmental, socioeconomics and planning.

The population and racial diversity maps for the entire U.S. are available for download at http://sil.uc.edu/.

Stepinski says future research will involve calculating similar maps using 2010 U.S. Census data and 2011 land cover data.

Provided by University of Cincinnati