

U.S. Race Diversity Dynamics During the 1990-2000 Period at 90m Spatial Resolution

Anna Dmowska and Tomasz F. Stepinski

dmowskaa@ucmail.uc.edu stepintz@uc.edu

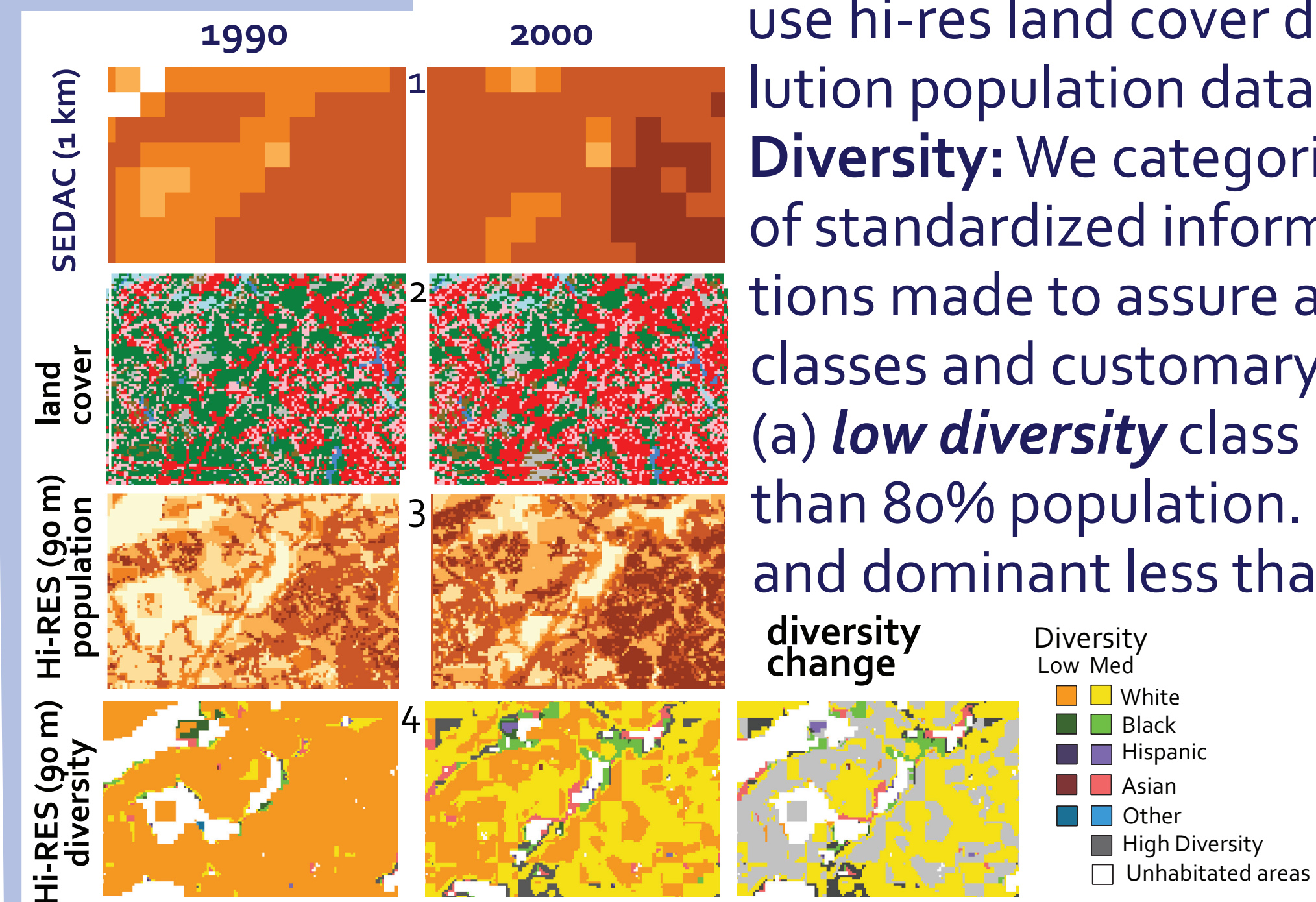
Space Informatics Lab, Department of Geography
University of Cincinnati, Cincinnati, Ohio USA
<http://sil.uc.edu/>



Introduction

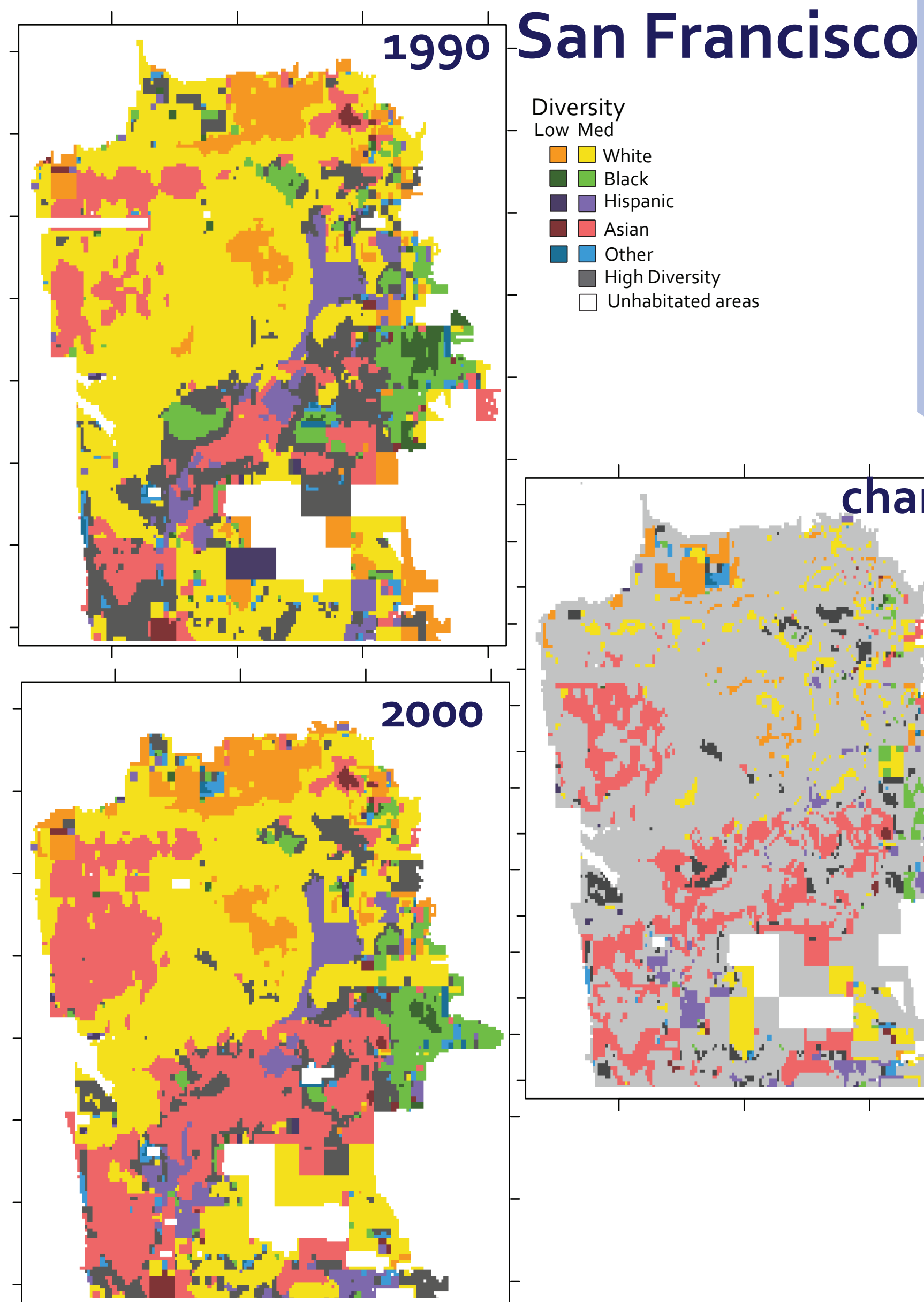
The U.S. is a racially diverse country, but in 1990 different racial groups have lived mostly separated from each other. To investigate if and how that changed we assess U.S. population dynamics in the 1990-2000 period. The U.S. Census releases population and socio-economic data aggregated to areal units called the census blocks. A subset of this data is also available from Socioeconomic Data and Application Center (or SEDAC) as 1 km census grids. In order to get as high resolution data as possible we have sharpened SEDAC grid to 90 m by calculating a dasymetric model of the U.S. population and its socio-economic attributes using the 30 m National Land Cover Datasets 1992 and 2001 as ancillary data. Using the hi-res data we classify population in all 90 m cells into 11 different "racial diversity" classes. Comparison of 1990 and 2000 classifications brings insight to the dynamics of race diversity in the U.S. during that period.

Methods



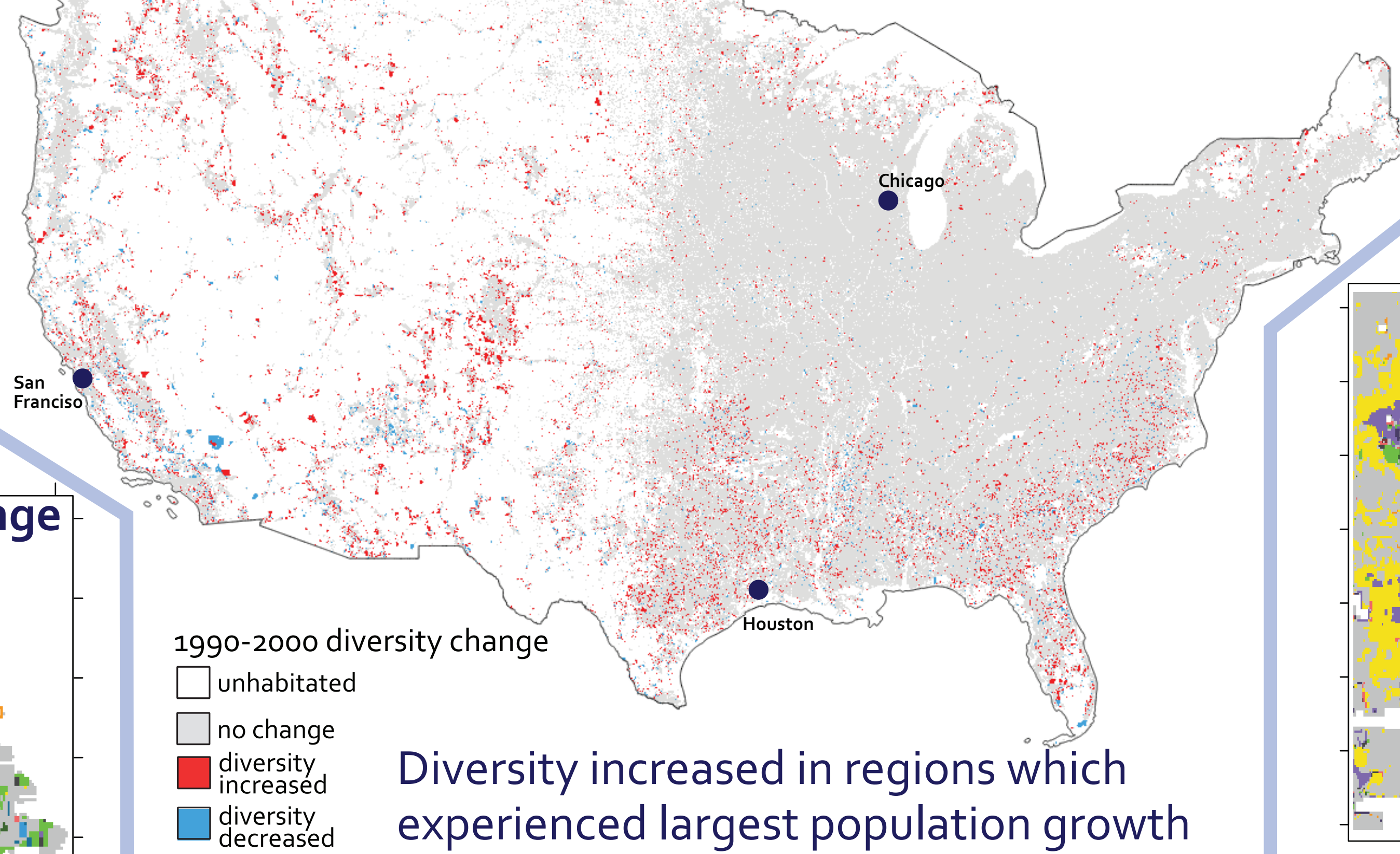
Dasymetric Mapping: We follow a standard procedure to use hi-res land cover data (2) to disaggregate lower resolution population data (1) into a hi-res population data (3).
Diversity: We categorize racial diversity on the basis of standardized informational entropy (E) with modifications made to assure agreement between obtained classes and customary notions of group dominance:
(a) **low diversity** class if $E < 0.41$ and dominant race more than 80% population. (b) **high diversity** class if $E > 0.79$ and dominant less than 50% population. (c) **medium diversity** otherwise. Low and medium diversity classes are further subdivided with respect to dominant race (see the legend).

Geography of change

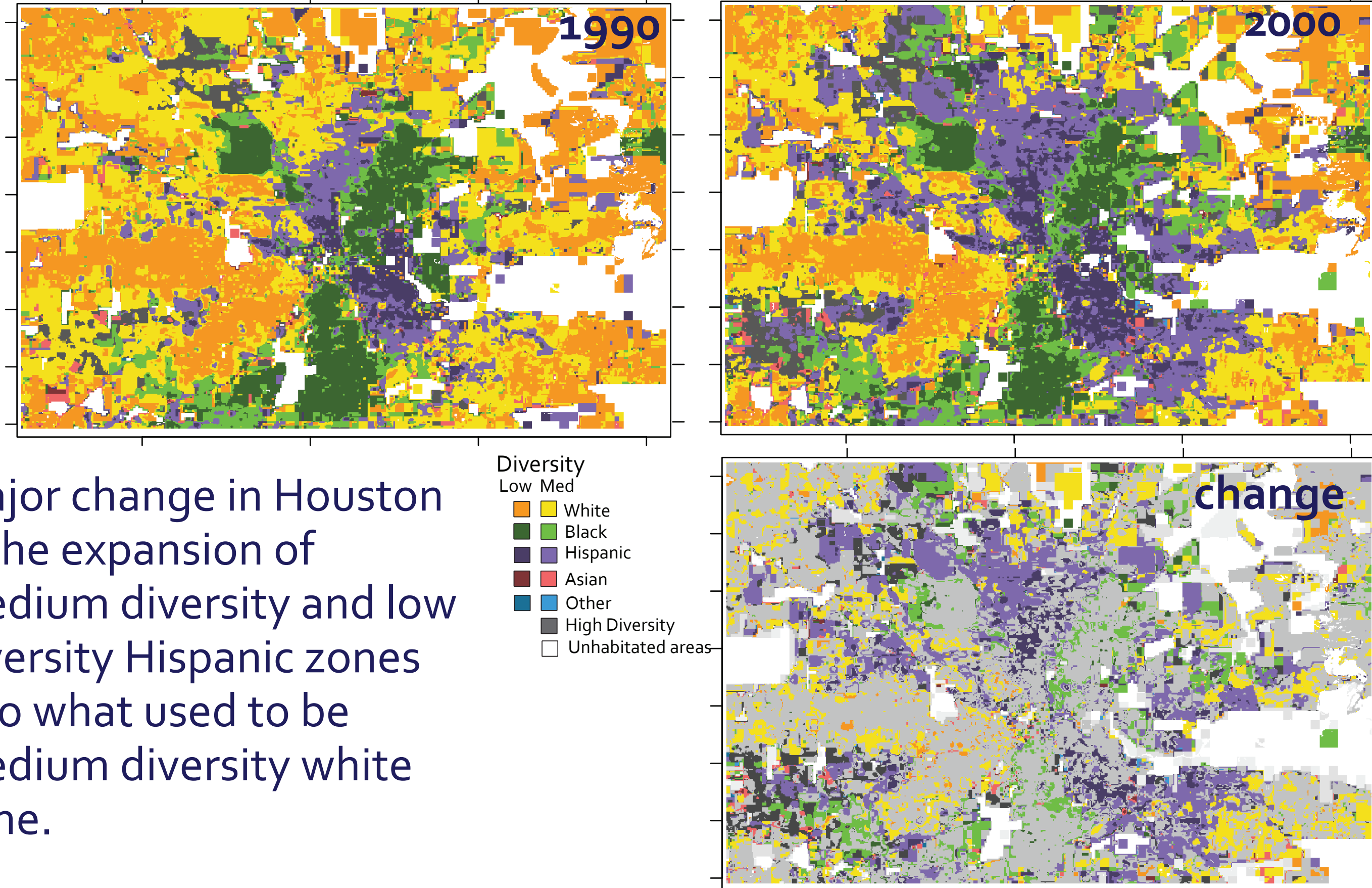


Major change in San Francisco is the expansion of medium diversity Asian zone into what used to be medium diversity white zone.

U.S.-wide map of diversity change

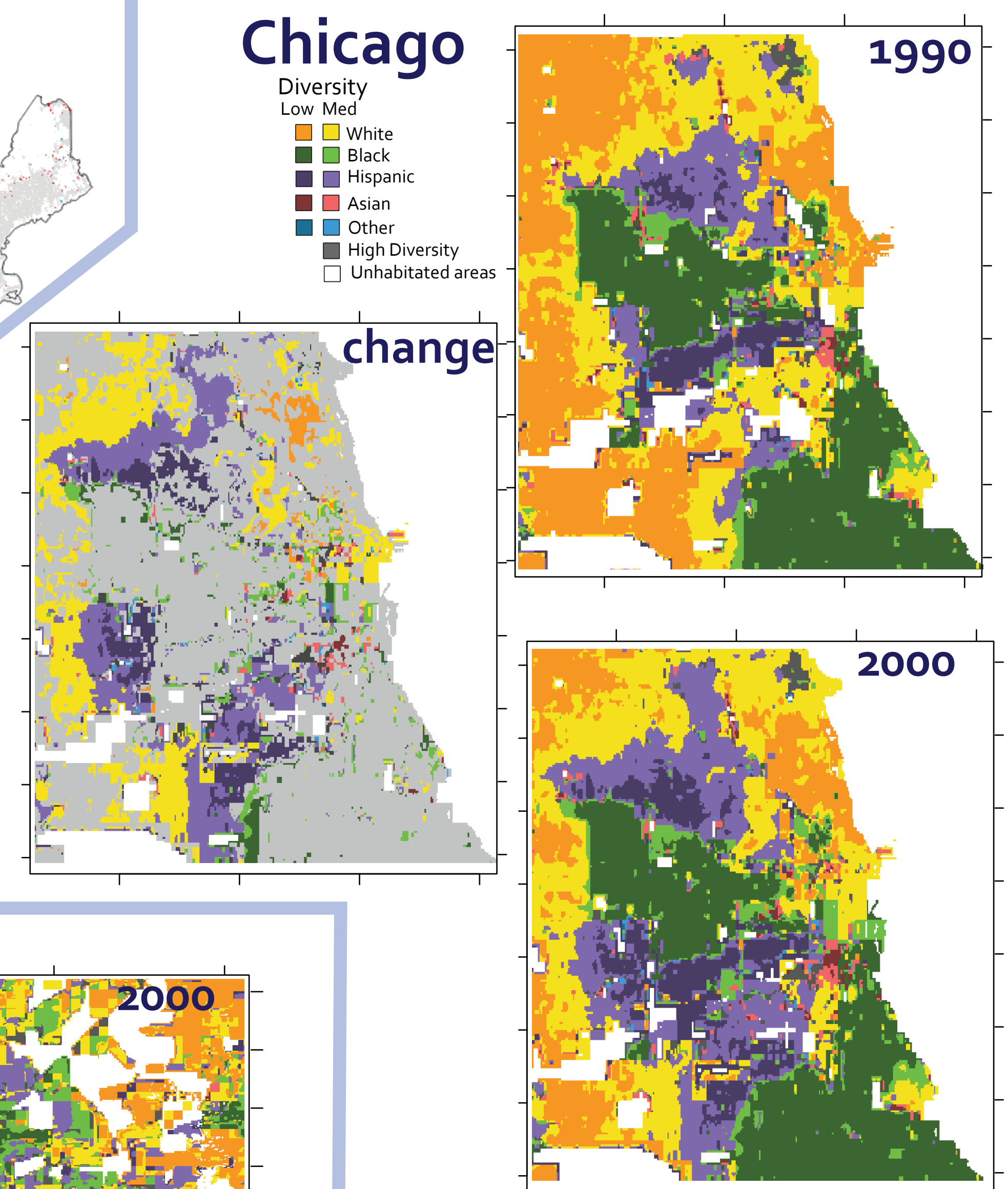


Houston



Major change in Houston is the expansion of medium diversity and low diversity Hispanic zones into what used to be medium diversity white zone.

Chicago

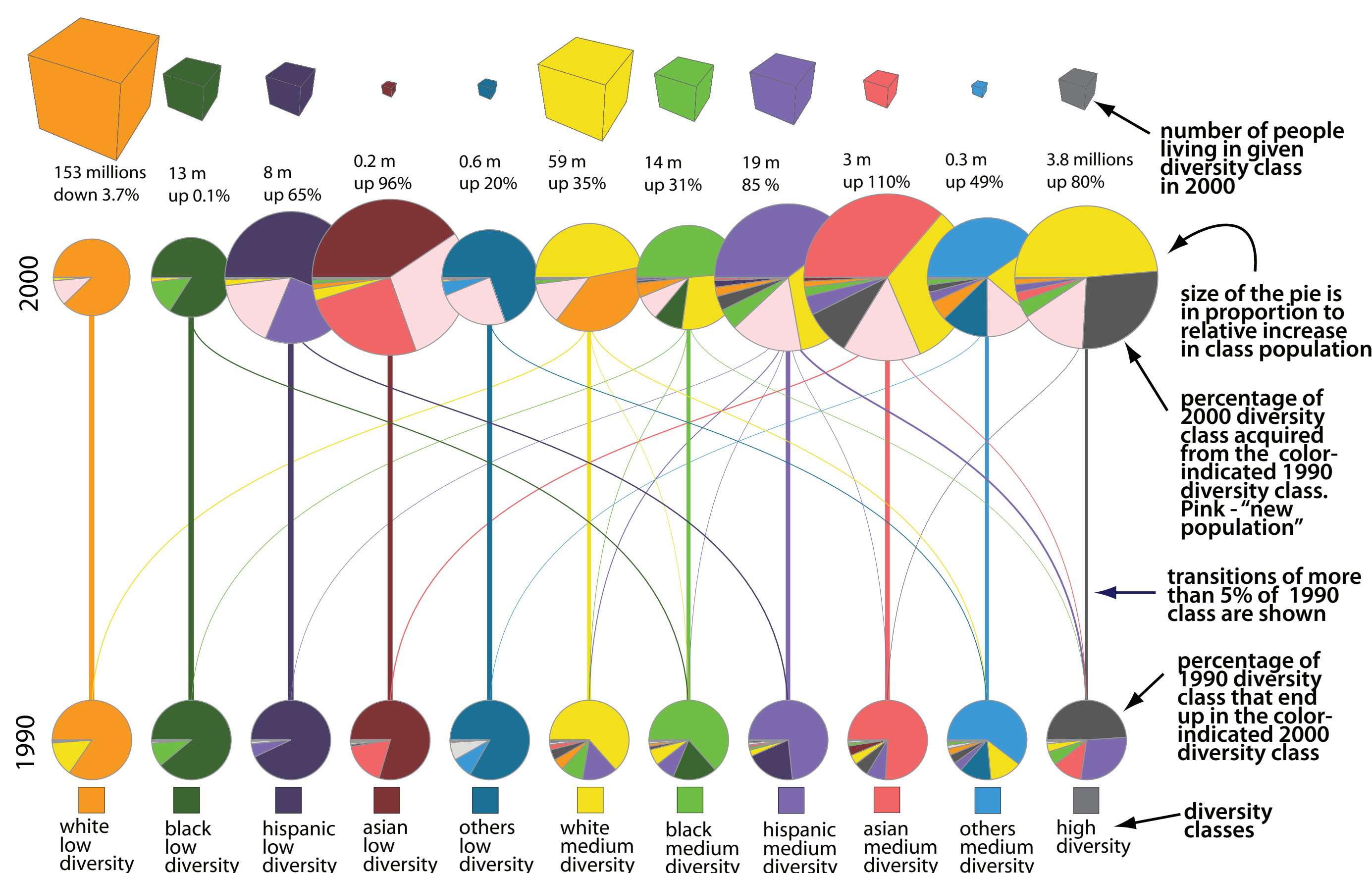


Major change in Chicago is the expansion of medium diversity and low diversity Hispanic zone into what used to be medium diversity white zone. Also, expansion of medium diversity white zone into what used to be low diversity white zone.

Statistics of change

Diversity dynamics is assessed from transitions matrix that keeps track of redistribution of population between different diversity zones. The result is shown in a diagram to the right. Overall change in population between low, medium, and high diversity zones is shown below.

Diversity dynamics



Conclusions

Racial diversity has increased by about 8.3% in the period of 1990-2000, while the population has increased by about 12%.

Geographically, diversity increased mostly in regions of largest population growth.

Low diversity zones dominated by Hispanics and Asians has expanded into previously medium diversity zones dominated by those races.

Medium diversity zones dominated by Hispanics and Asians has expanded into previously medium diversity zones dominated by whites.

Medium diversity zone dominated by blacks has expanded into previously medium diversity zone dominated by whites.

Medium diversity zone dominated by whites has expanded into previously low diversity white zone.

High diversity zone expanded into previously medium diversity white zone.