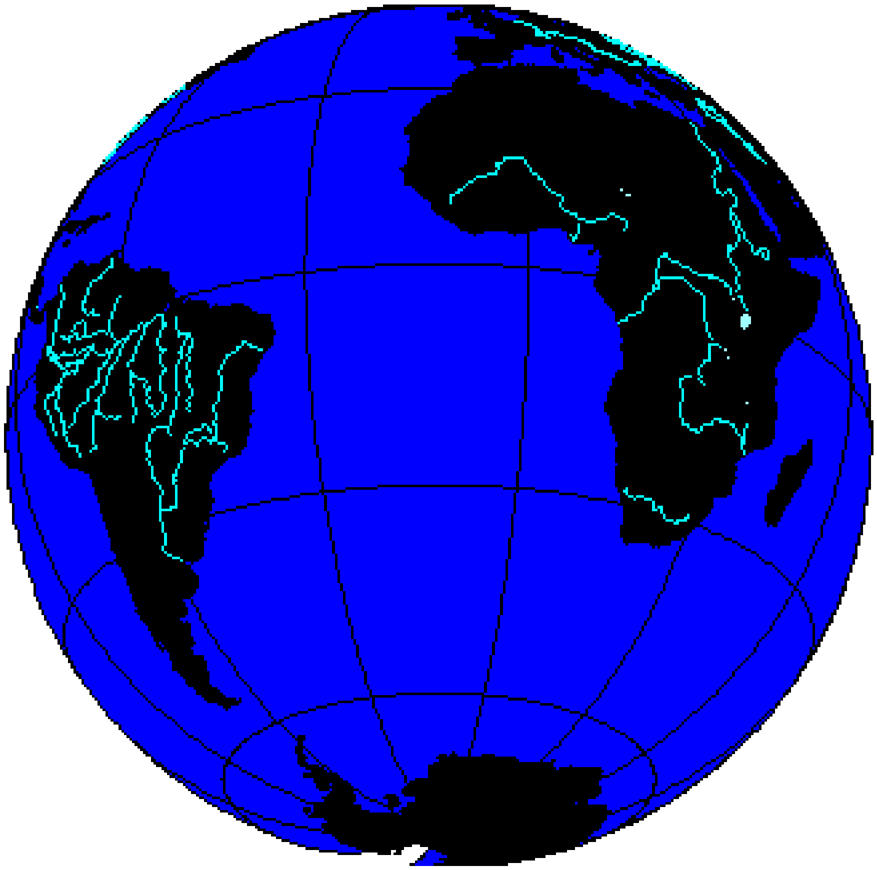
SOLSTICE:
An Electronic Journal of Geography and Mathematics.

(Major articles are refereed; full electronic archives linked)

SOLSTICE:

AN ELECTRONIC JOURNAL OF GEOGRAPHY AND MATHEMATICS



Earth: with 23.5 degrees south latitude as the central parallel.

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SOLSTICE: AN ELECTRONIC JOURNAL OF GEOGRAPHY AND MATHEMATICS

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MISSION STATEMENT

The purpose of Solstice is to promote interaction between geography and mathematics. Articles in which elements of one discipline are used to shed light on the other are particularly sought. Also welcome are original contributions that are purely geographical or purely mathematical. These may be prefaced (by editor or author) with commentary suggesting directions that might lead toward the desired interactions. Individuals wishing to submit articles or other material should contact an editor, or send e-mail directly to sarhaus@umich.edu.

SOLSTICE ARCHIVES

Back issues of Solstice are available on the WebSite of the Institute of Mathematical Geography, http://www.imagenet.org and at various sites that can be found by searching under "Solstice" on the World Wide Web. Thanks to Bruce Long (Arizona State University, Department of Mathematics) for taking an early initiative in archiving Solstice using GOPHER.

PUBLICATION INFORMATION

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In Memoriam

Donald Frederick Lach

September 24, 1917 - October 26, 2000

Bernadotte E. Schmitt Professor Emeritus
of History
University of Chicago

Author: *Asia in the Making of Europe*,
The University of Chicago Press.

Scanned floral image by Alma S. Lach.
Real flower from the rose garden of the Quadrangle Club, donated by Nicholas Fulop.

FIFTY YEARS OF SPATIAL ANALYSIS: A SYMPOSIUM IN HONOR OF WILLIAM L. GARRISON, 1950-2000

PHOTO ESSAY BY JOHN D. NYSTUEN

Brian J. L. Berry (right) presents plaque to William L. Garrison (left) commemorating the award of his Ph.D. from Northwestern University in 1950.

Text of plaque

LEADERSHIP 1950-2000
Presented to
William L. Garrison

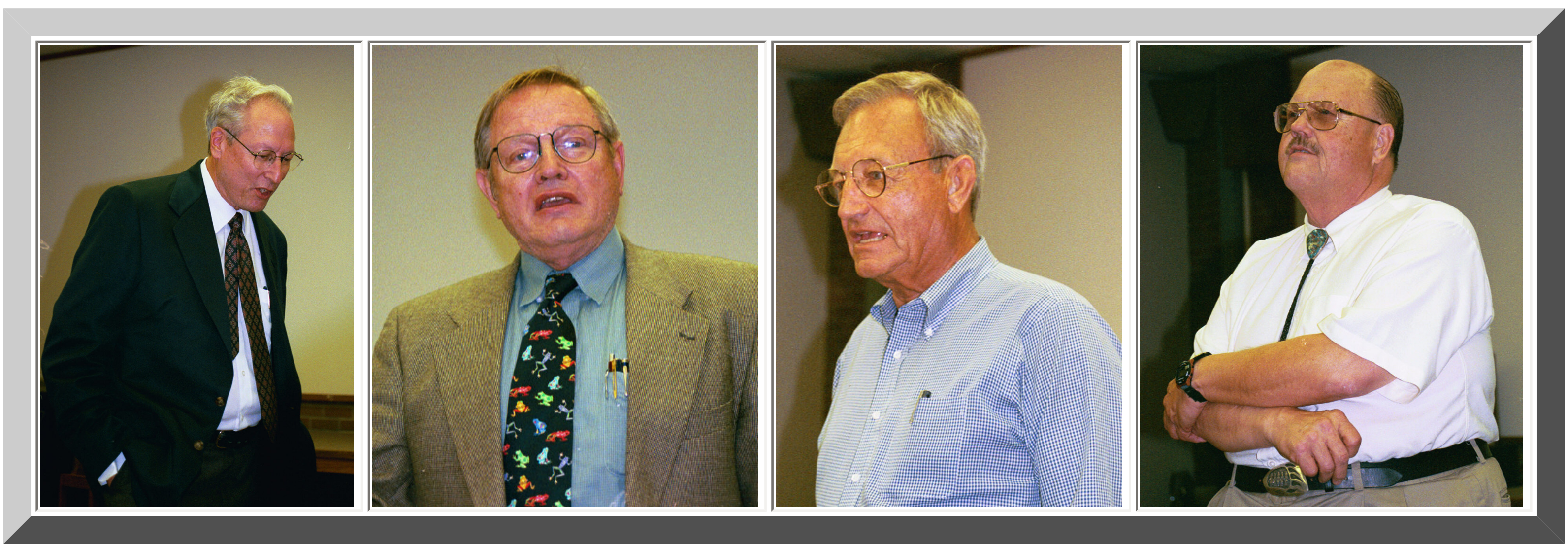
In Appreciation of Fifty Years
of Inspirational Leadership to the
Geographical and Transportation Sciences

With Respect and Appreciation
The Space Cadets
2000

Professor Garrison's Ph.D. students at the University of Washington (1958-1961), as they appeared Friday, September 15, 2000 (not arranged in chronological order, but in a pattern that is visually appealing to the author).

Left to right, date of Ph.D. and most recent institutional affiliation noted.

Richard L. Morrill (Ph.D. 1959), University of Washington, Professor Emeritus.
Waldo R. Tobler (Ph.D. 1961), University of California, Santa Barbara, Professor Emeritus
Michael F. Dacey (Ph.D. 1960), Northwestern University, Professor and Associate Dean.
Brian J. L. Berry (Ph.D. 1958), University of Texas, Professor.



Arthur Getis (Ph.D. 1961), San Diego State University, Professor
John D. Nystuen (Ph.D. 1959), The University of Michigan, Professor Emeritus
David L. Huff (Ph.D. 1960), University of Texas, Professor
Duane F. Marble (Ph.D. 1959), Ohio State University, Professor Emeritus

Not shown: William W. Bunge (Ph.D. c.1961), Arthabaska, Quebec.

Other speakers photographed:

Forrest R. Pitts (Ph.D. Michigan, 1955), University of Hawaii, Professor Emeritus
Julian V. Minghi (Ph.D. Washington, 1962), University of South Carolina, Professor
William B. Beyers (Ph.D. Washington, 1967), University of Washington, Professor
Leslie Curry (Ph.D. New Zealand, 1959), University of Toronto, Professor Emeritus

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Other pictures

[On the campus]
[At the talks]
[On the boat]

A Neighborhood Information System within Ann Arbor, Michigan

Sandra L. Arlinghaus
Lloyd R. Phillips
The University of Michigan
Adjunct Professor, School of Natural Resources and Environment and College of Architecture and Urban Planning;
Graduate Student, College of Engineering, Atmospheric and Oceanic Sciences

The power of the internet is with us on a daily basis; however, what we see is (obviously?) only the tip of the iceberg. How can we make better use of it, and the various software package available for mapping and data analysis, in helping people to learn more about their own local settings? The City of Ann Arbor maintains a clickable map site of self-identified neighborhoods (R. Scaff, W. Rampson, C. Hurd, and the first author); http://www.ci.ann-arbor.mi.us; see the Planning Department portion of that website).

There have been a number of recent efforts to create Neighborhood Information Systems

- http://nkla.sppsr.ucla.edu;
- http://www.ci.seattle.wa.us;
- http://www.cnt.org/news/demo/html;
- http://oaklandnet.com/government/government23.html;
- http://www.ci.ontario.ca.us/gis/index.asp;
- http://www.ci.mil.wi.us/citygov/assessor/assessor.htm;
- http://povertycenter.cwru.edu/cando.htm;
- http://imlab9.landarch.uiuc.edu/~eslarp/egrets/;
- http://www.libertynet.org/nol/natl.html;
- http://www.upenn.edu/wplp/wpdd/wpddhome.htm;
- http://www.inforain.org/olmap.htm;
- http://WWW.rtk.net;
- http://little.nhlink.net/nhlink/;
- http://www.freenet.msp.mn.us/nhoods/mpls;
- http://www.brook.edu;
- http://www.nonprofitresearch.org).

One approach to considering Management Information Systems, at the country or regional level, has involved: "assessment," "analysis," "action," and "feedback" (Community Systems Foundation, http://www.csfnet.org/). We employ that strategy here to look at a small section of Ann Arbor, Michigan as a pilot project in developing Neighborhood Information Systems in southeastern Michigan. Please move now to that site.

Animaps, Again

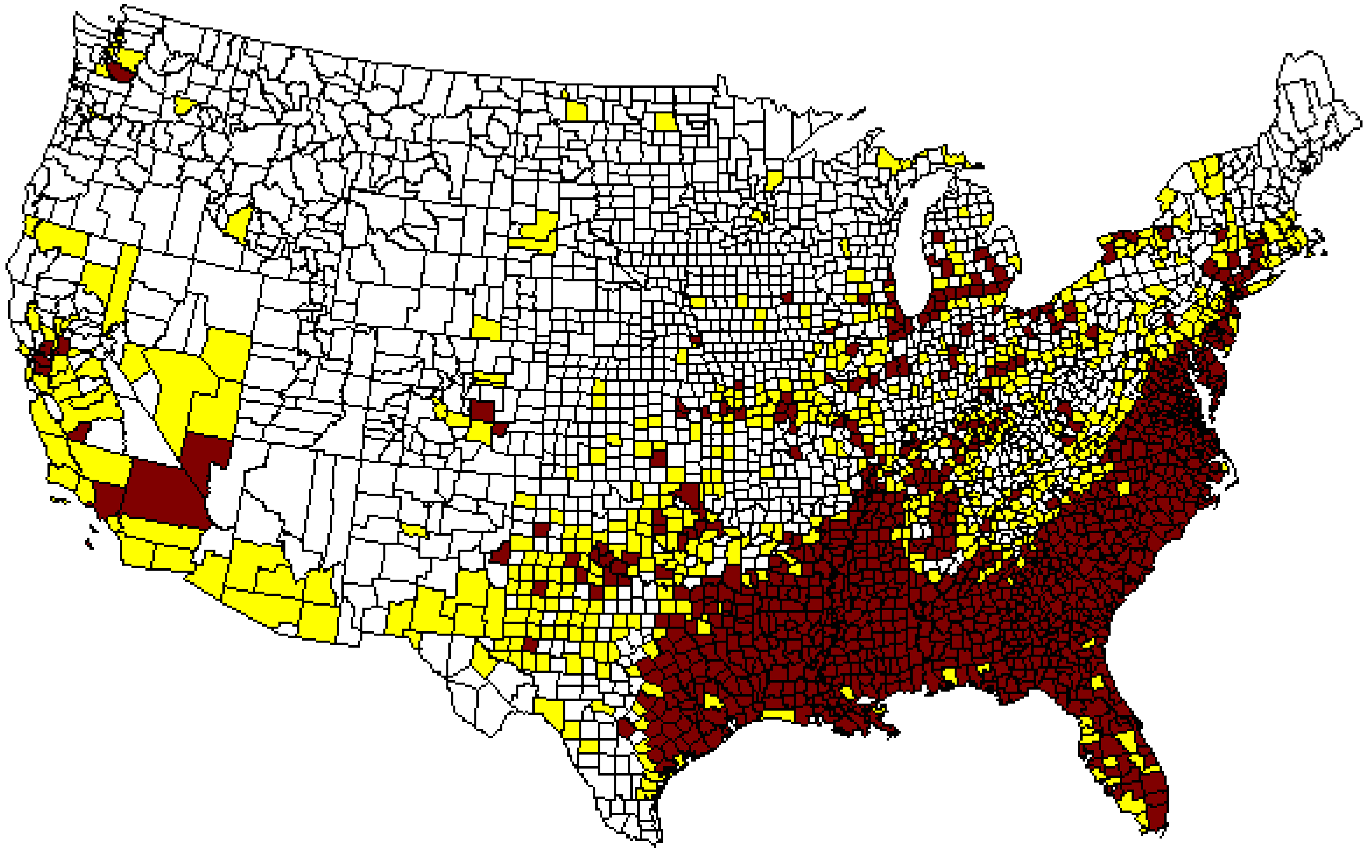
Courtney Gober
The University of Michigan
Student, Master of Art and Certificate Program in the Graduate Division of
The School of Education

An earlier article in Solstice constructed an Animated Map, "Animap," from current data to suggest pattern that might exist if actual data were available. To quote from that article:

> Sometimes it is difficult to acquire data over a period of time. With a bit of imagination, one may instead be able to use a surrogate variable to capture easily what might otherwise have been difficult to capture. To illustrate this sort of technique, in a time-dependent framework, consider the following animap. When African-Americans first came to North America, they entered often along the south and southeastern shores of modern-day U.S.A. Over time, population migrated and moved throughout the country. If one considers as a surrogate to having year by year data for that movement, the fact that not many people move over time all that far from their point of entry to the country, then one might capture the temporal movement pattern over centuries by the spatial density pattern at a single time slice. To test this idea from the standpoint of simple mapping, the U.S. was mapped by county according to density of African-American population (1990 Census data) (S. Arlinghaus and A. Laug). The mapping of this initial test-run was kept simple: the default lat/long framework, rather than a conventional projection, were used in the GIS (Atlas GIS, version 3.03) for eventual ease in switching to other projections. As had Nystuen, Laug wished to color percentages from previous frames all in one color, with percentages in the current frame colored in a different set of colors. She also wanted to track the advancing edge, as had Nystuen, but in addition wanted to see gradations in that edge. There is a tradeoff in clarity; how many categories should one use on the edge?

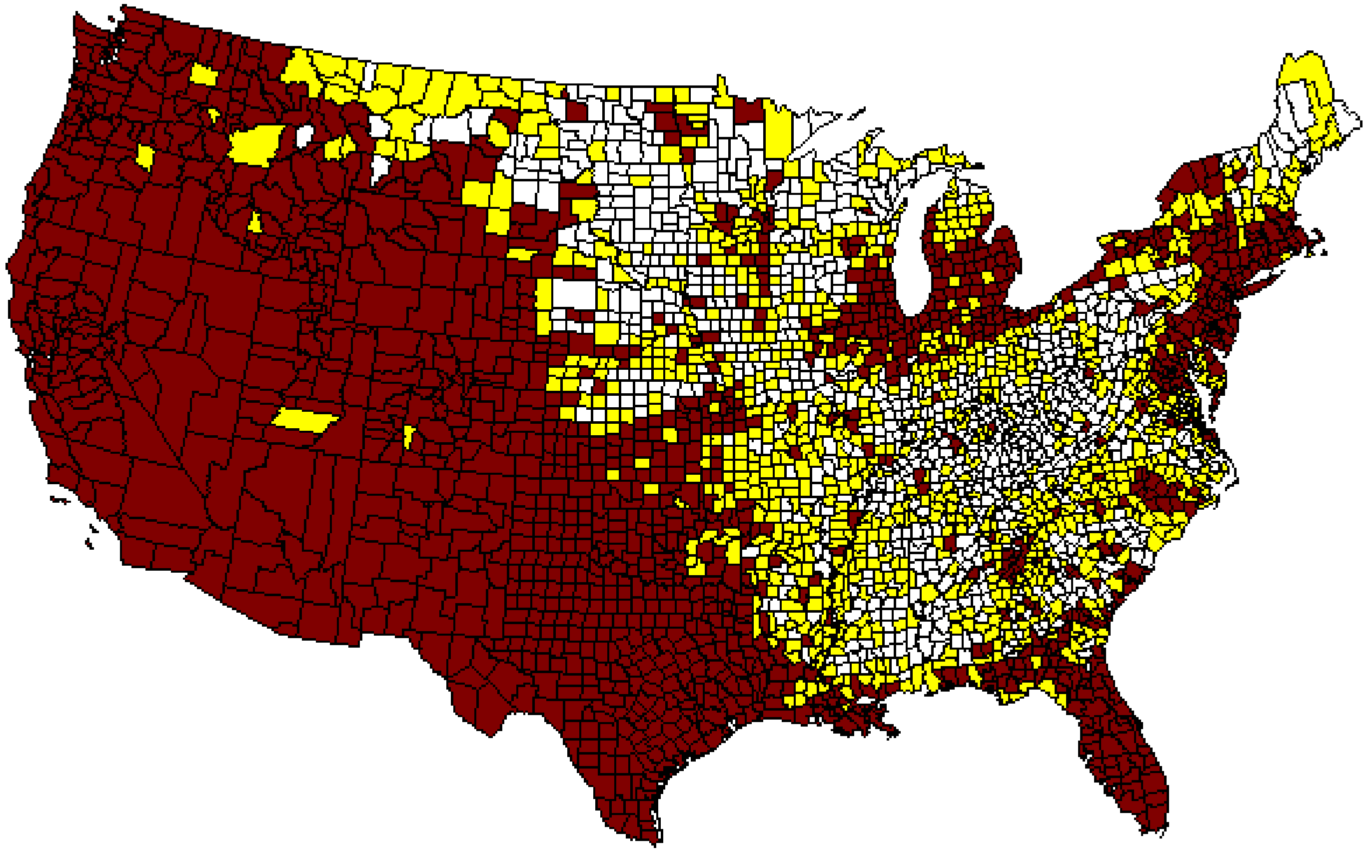
In this article, the map from the previous article is recast using an Albers projection, and the edge gradations are removed in favor of a single edge color. Thus, counties shaded burgundy are ones for which the density has been measured. The edge counties colored yellow are those introduced at that particular time frame. Those left as white have not yet entered the picture.

AFRICAN AMERICAN ANIMAP



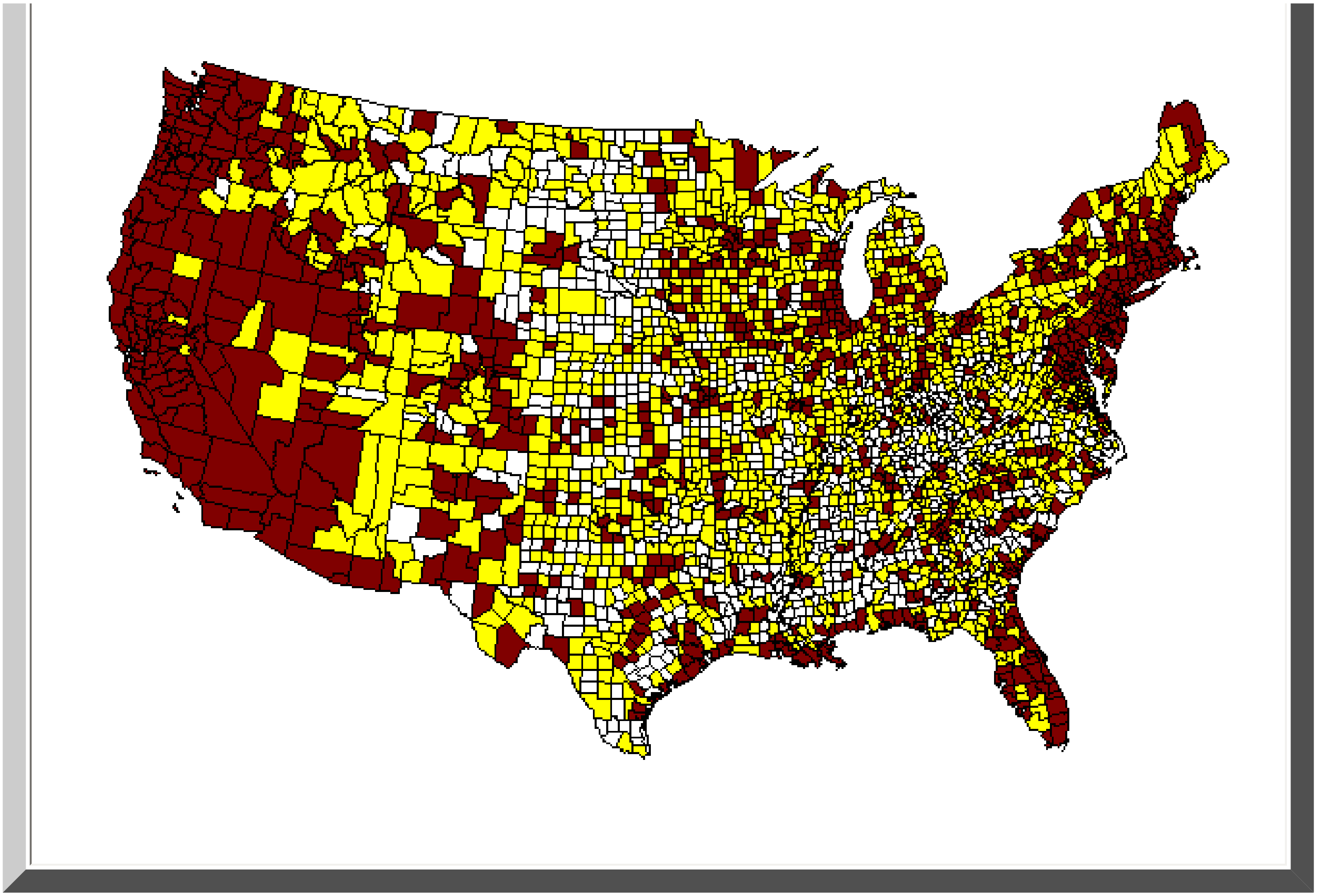
As in the previous case the counties with highest percentage African American populations (as measured in 1990 Census data) enter the map first. The manner in which they do so is reminiscent of actual migration patterns. The premise is that people, even over a substantial time interval, do not, as large groups, move quickly from their original ports of entry. Does this idea extend to other ethnic groups? The maps below show the same analysis applied to 1990 Census data for percentage Hispanic and percentage Asian populations by county.

HISPANIC ANIMAP



The Hispanic Animap also suggests a pattern of diffusion that reflects (but does not exactly replicate) reality. The heavy early populations are along the U.S. Mexico border, followed by Florida and large cities in the northeast and midwest. One issue with creating animaps is to decide when to stop the process; otherwise, the whole nation will eventually become burgundy. There is a tradeoff in process and meaning.

ASIAN ANIMAP



The case of the Asian Animap is a bit different. In the early frames, one sees the "expected" pattern with high densities on the west coast. In the next stage, one sees high densities enter in large cities across the nation, and, at the same time, high densities in what appear to be counties far removed from the largest cities. When those "unexpected" counties are checked, all contained large (mostly public) universities. In the case of the Asian population, the American university system appeared as a measurable agent fostering diffusion of population, even in this simulation.

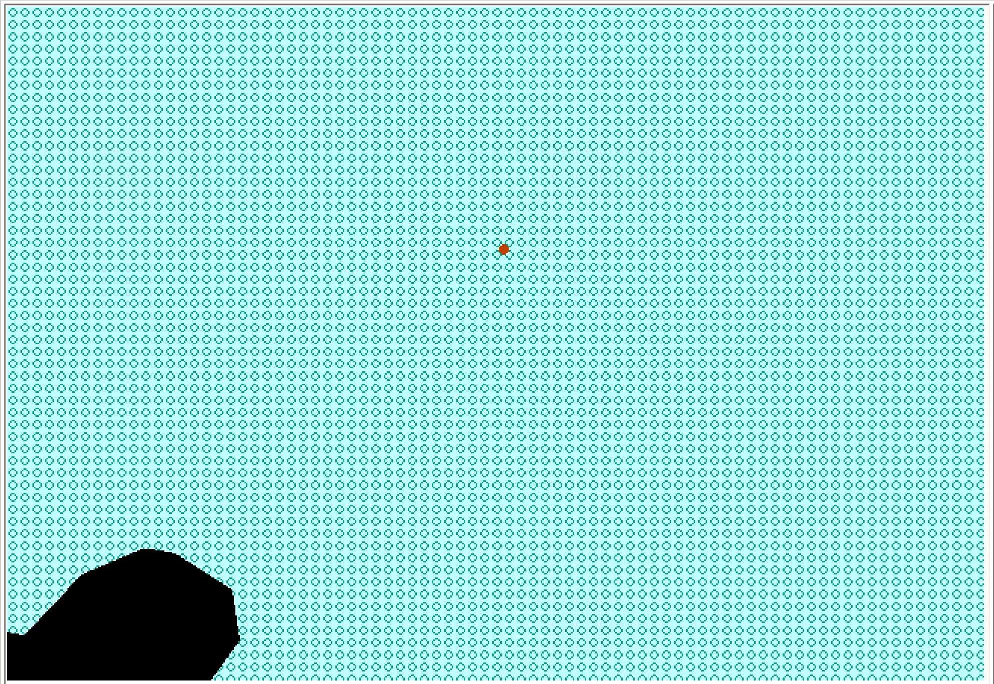
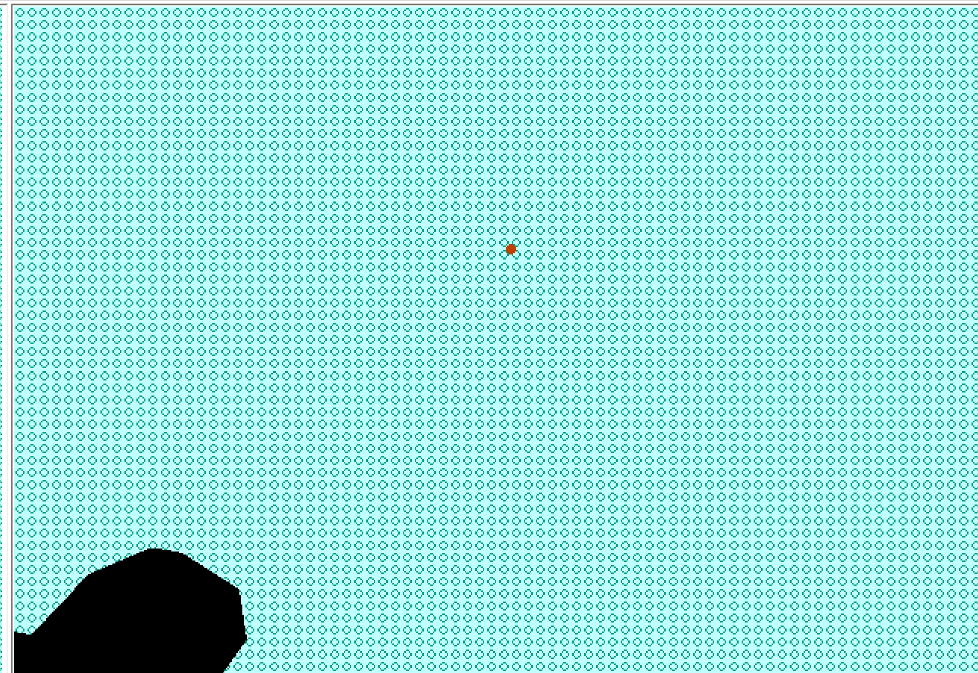
How nice it is to have an easy-to-use strategy to capture movement general movement patterns. It would have been a monumental task to gather data on a county by county basis, from the first entry, for each of these populations. Instead, use of a well-chosen surrogate variable permitted creation of animated maps in a matter of a few hours.

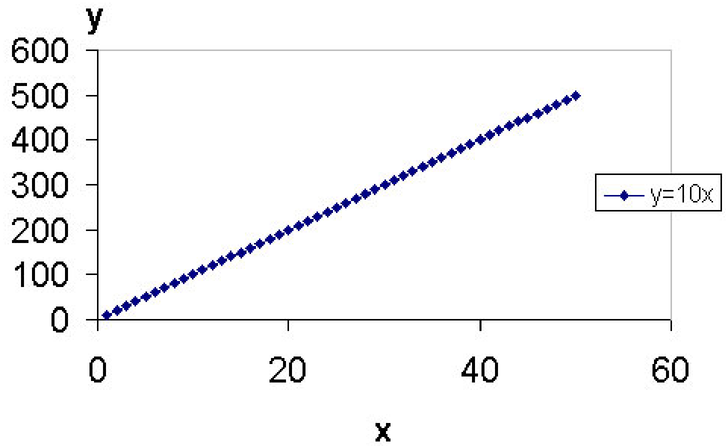
Animap Sequences

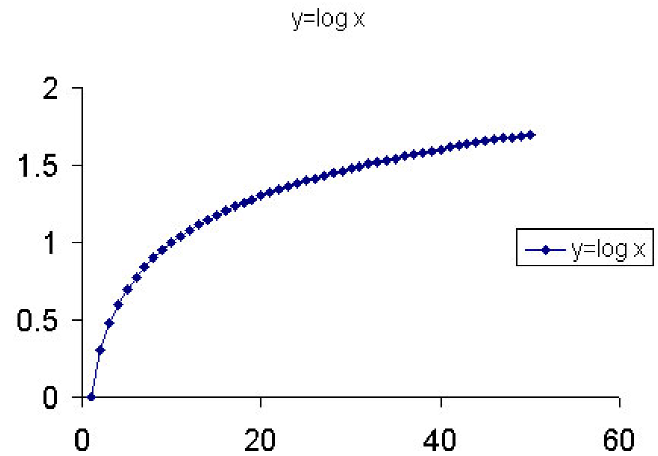
Nakia D. Baird
The University of Michigan
Student, Master of Art and Certificate Program in the Graduate Division of
The School of Education

An earlier article in Solstice examined the merits of an animated sequence of Triangulated Irregular Networks (TINs) to introduce an element of order into complicated pattern. In that earlier map (takes time to load on a slow modem), the time distance between successive frames was constant (12/100 of a second between successive frames in the set of 50 frames "in" and 50 frames "out"). Views such as this offer a way to clarify geographic ideas. They might also be used, however, to make mathematical concepts come alive.

It is this latter idea that is examined here. When a constant interval is chosen between successive animation frames, a linear equation is portrayed: in this case, for ease in generalization, suppose y=10x --- the time-spacing between successive frames ("in" only) is 10/100 of a second. The left column in the table below shows half of the map from the previous article along with the graph it might be viewed to represent. Unit changes in x values produce a constant difference between corresponding y values: the viewer is set down on Earth at an apparently uniform rate.

 Source of original map	 Source of original map:
y=10x	





Suppose instead of using y=10x, one "mapped" y=$\log_{10}$ x. The results would appear as in the right hand column of the table above. As values of x get larger, the successive differences between the corresponding values of y get smaller. Hence, the viewer is "smashed" more rapidly to Earth!

This procedure need not be limited to continuous functions. The sequence of maps appears continuous but is in fact discrete. Animaps can easily be used as well to model discrete series.

What can be used in one direction to shed light on geographic ideas can be turned around to make possibly difficult mathematical ideas more appealing to learn. This sort of idea is just a beginning--the reader might try numerous other interesting variations on this theme.