Cartogram Capsule

AKA

The Divided States of Cartogramerica

Time-based Cartogram Visualization/ Interface for Energy Usage

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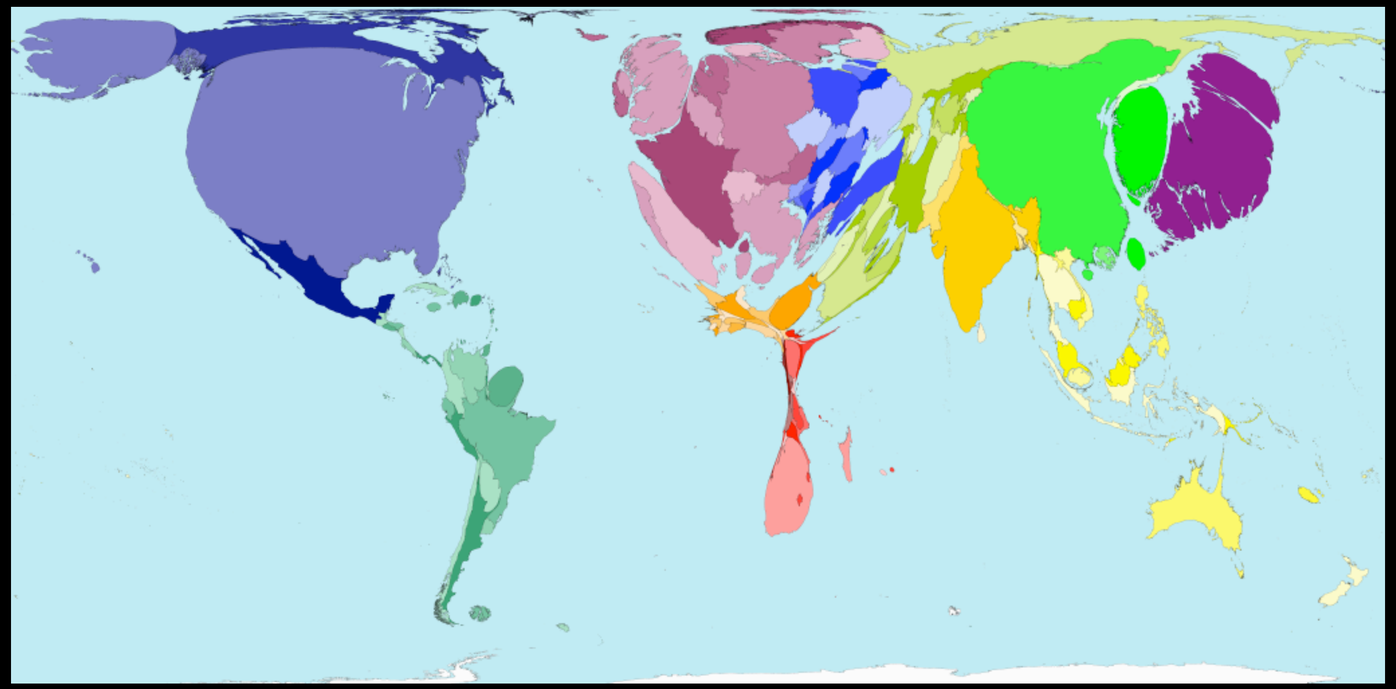
Background + Goal

"A cartogram is a map in which some thematic mapping variables - such as travel time or Gross National Product - is substituted for land area or distance. The geometry or space of the map is distorted in order to convey the information or this alternate variable. There are two main types of cartograms: area and distance cartograms." -Wikipedia

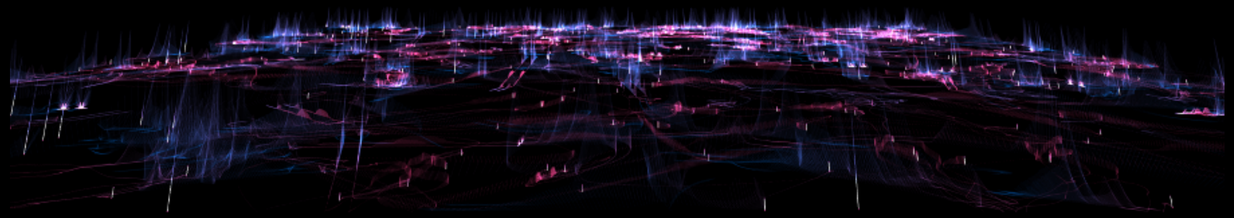
These kinds of visualizations do a wonderful job of giving data perspective at a given moment in time, but can the technique be extrapolated in a way that can show evolution of the data over time? This is the question that we are trying to answer.

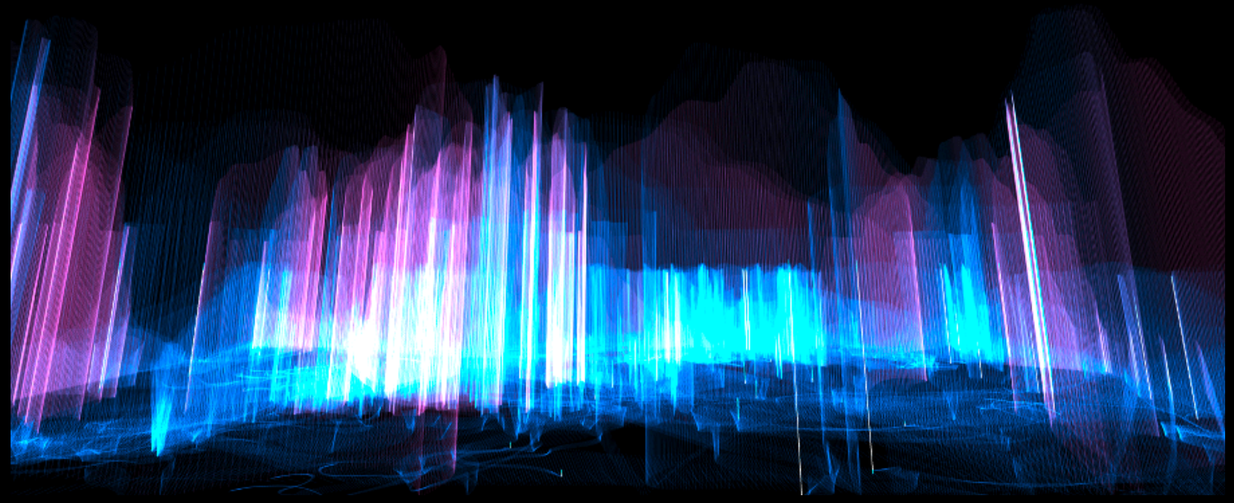


This area cartogram shows 16,132,166 million kilowatt-hours of electricity generated in 2002, as distributed throughout the world's nations. Territory size is proportional to the percentage of world electricity production that occurs there. (source image: http://www.worldmapper.org/display.php?selected=117)

This area cartogram shows political party representation within the United States, with each country rescaled in proportion to population. Colors refer to the results of the 2004 U.S. presidential election popular vote. (source image: http://www-personal.umich.edu/~mejn/election/2008/)

Aesthetic technique



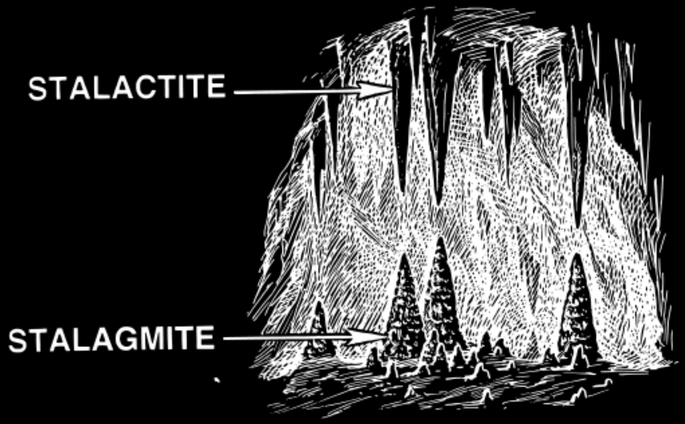


These visualizations are composed entirely of vertical lines or varying opacity and hue along a plane, to visualize a fictitious data set generated from GPS recorders mounted on luggage pieces, moving around an airport. A careful treatment of fine lines would be crucial in keeping a 3D cartogram within the realm of comprehension. (source images: Tim Stutts, OpenFrameworks Visualization Concepts, IBM “Smarter Planet” Print Advertisement Campaign, 2010, http://www.timstutts.com)

A cartogram over time could be visualized in one of two ways--as a changing singular still image of time or a series of images stacked on top of each, each representing a sample of the data-set in time.

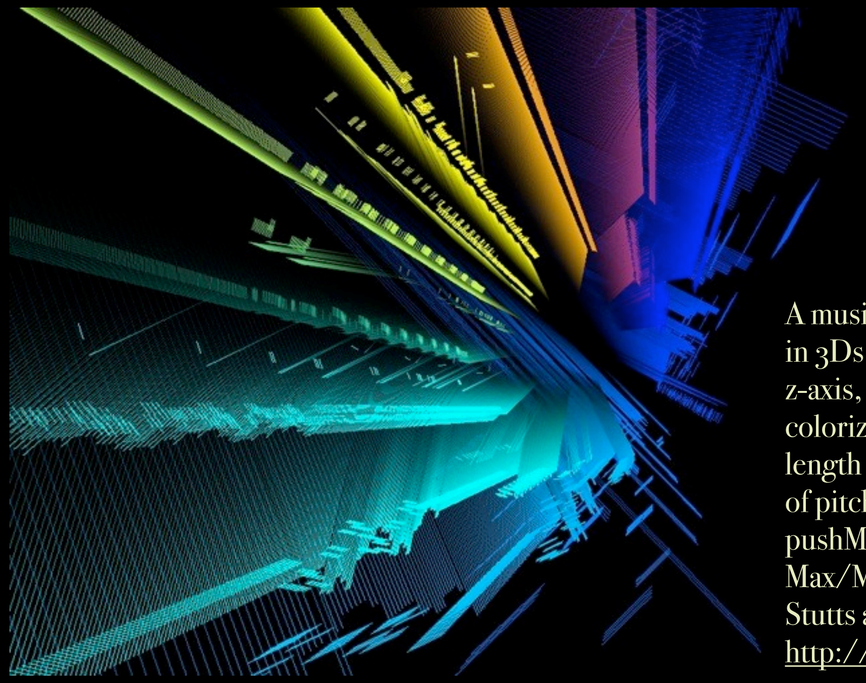
The latter method is of greater interest to us, in that it exposes the full form and trajectory of the data-set--an entire life-span as the body grows and evolves; a witness to potential births/deaths, surpluses/shortages.

A time-based cartogram visualizing energy usage turned on it’s axis, as we’d imagine it, might come to resemble speleothems within in a cave, but with a visual treatment involving the use of fine line, to where the totality of the form is translucent, yet comprehensible.

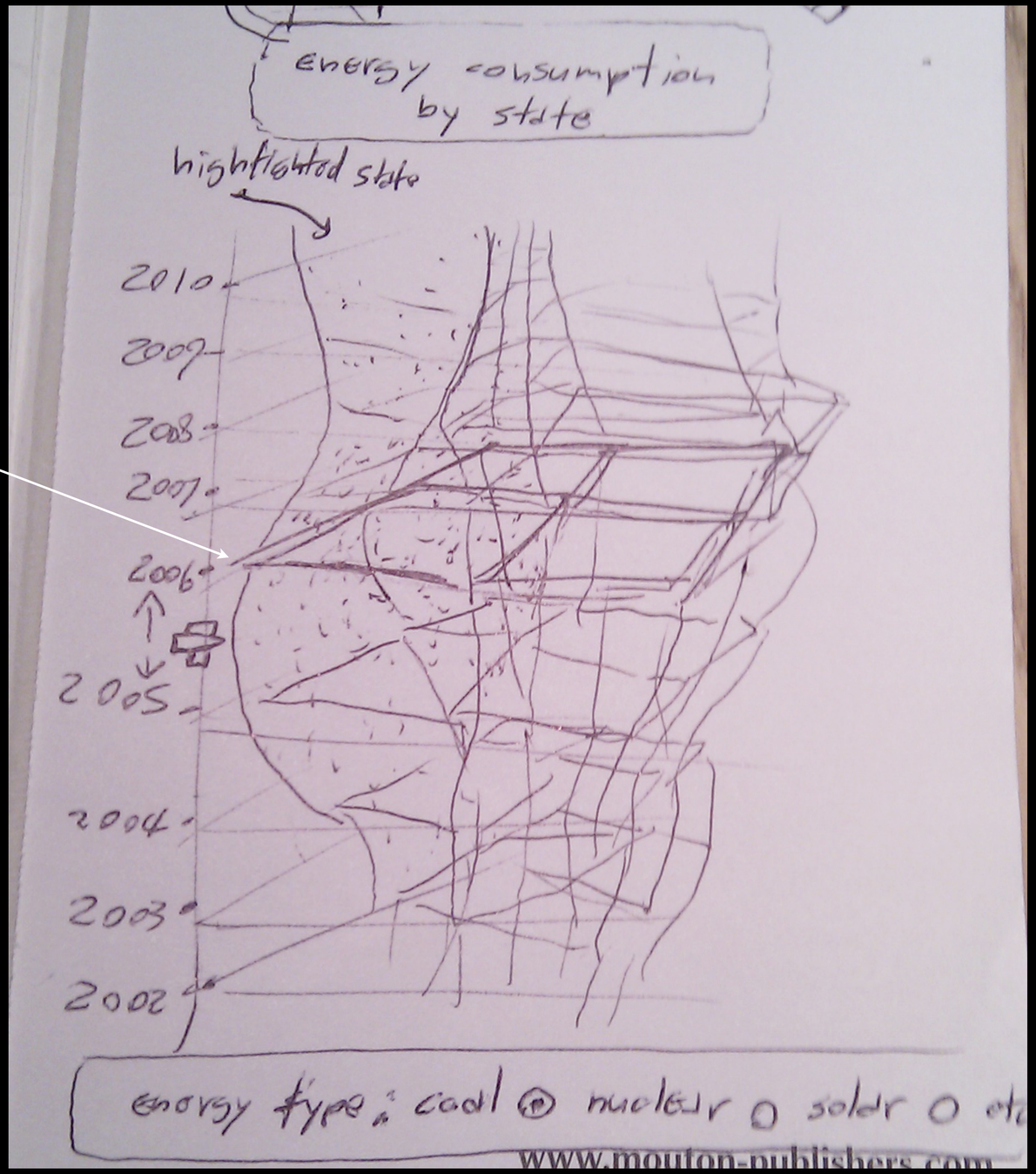


Implementation and interface

The visualization we propose is a linear (z-time) three dimensional model of a cartogram projection of the regions within a country, whose surface area represents energy consumption over time (renewable vs non-renewable energy and other comparisons). The visualization (as sketched on the right) would run as a standalone desktop application, providing the user the ability to highlight a given moment or slice of time via vertical scroller, solo specific regions, and toggle between several politically meaningful energy-related data-sets.



A music composition visualized in 3Ds pace, with time along the z-axis, and voices represented as colorized pedals, with pedal length (radius), being a function of pitch. (source image: pushMusic, openFrameworks + Max/MSP composition by Tim Stutts and Rui Pereira, 2007, http://www.timstutts.com)



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