FULLER PROJECTION: DYMAXION AIR-OCEAN WORLD

WHAT IS THE DYMAXION MAP?

- A map of the Earth which presents geographic information in a single, comprehensive picture without breaks in any of the continental contours, or any visible distortion of the relative shapes or sizes of the land masses.
- A world projection with negligible distortion which can accurately display at a glance global information such as human migration patterns and the distribution of natural resources.

A NEW PERCEPTION OF EARTH

World maps are symbolic tools which help to shape our perception of Earth. Every world map projection must make certain compromises as information is transferred from a spherical globe to a flat surface. With this in mind, as early as 1927 Buckminster Fuller, an educator, engineer, architect, author, cartographer and futurist, set out to develop the world's most accurate two-dimensional map. Fuller predicted even then that global travel would shift from sea to sky and anticipated the emergence of what he termed "a One-Town Air-Ocean World."

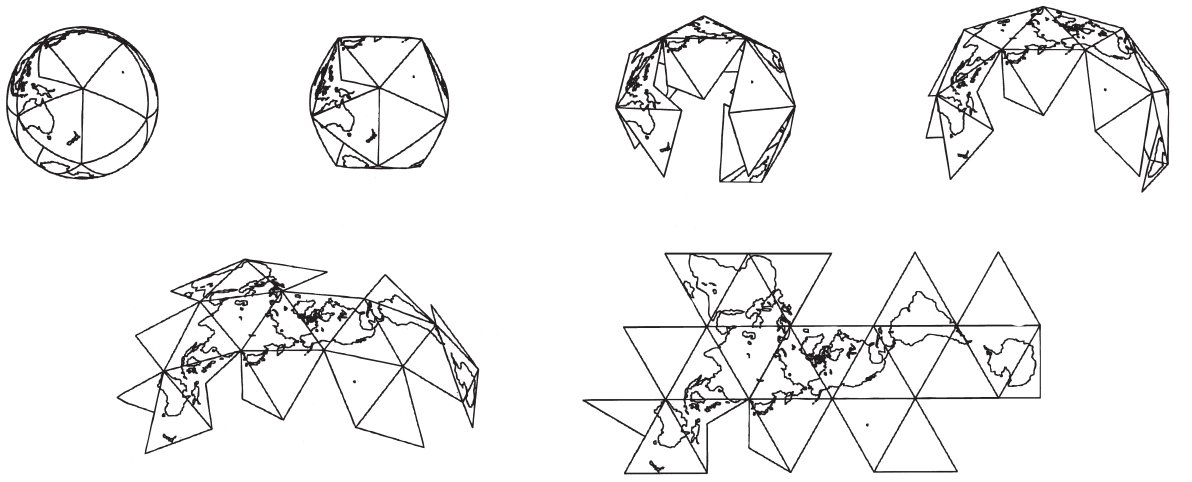
DESIGNING FOR ACCURACY

Using the same mathematical principles on which his world famous geodesic domes were to be based, Fuller carefully designed a way to display the world all at once, with the least amount of visual distortion. Throughout the next 26 years he refined his world projection through many successive versions in order to reach the highest level of accuracy. In 1954 Fuller called his final icosahedral projection the "Dymaxion Air-Ocean World." The term Dymaxion was coined in the 1930s from Fuller's most commonly used words: dynamic, maximum, and tension.

A TOOL FOR GLOBAL RESPONSIBILITY

With our increasing global awareness, a world map is needed which enables us to highlight the relationships among all nations and cultures of the world rather than one which emphasizes artificial boundaries between them. Environmental concerns are becoming a central focus of our international agenda. Therefore, we must learn to see what unites us rather than what separates us, and to chart global resources, population, and distribution patterns which characterize the complex trends and critical needs of the world today. In Fuller's own words, "the Dymaxion Map reveals a One-World Island in a One-World Ocean" which helps us to view the world as one interdependent system of relationships.

THE TRANSFORMATION SCENARIO



FREQUENTLY ASKED QUESTIONS ABOUT THE FULLER PROJECTION

WHAT IS MEANT BY "NO VISUAL DISTORTION?"

When transferring geographic data from the globe onto a flat plane, distortions will always occur in either shape, size, area, distance, or direction. On projections such as the Mercator map, the further north or south of the equator one goes, the more extreme the size distortion becomes. When comparing the Mercator map to a globe, it is easy for everyone to see that Greenland, for example, is much larger on the flat Mercator map than it is on the globe. However, when visually comparing landmasses on Fuller's map to that of a globe, the land masses appear to have their correct size. The Peters projection, on the other hand, sacrifices shape to preserve precise accuracy in overall land area, distortions which are obvious when comparing it to the globe. However, there are no visible shape discrepancies in any of the landmasses on Fuller's map when it is compared to a globe.

WHY AN ICOSAHEDRON?

A polyhedron is a many-sided three-dimensional object. An icosahedron is a polyhedron with 20 equilateral triangular faces. Of the five Platonic polyhedra (all of which have equal faces in size and shape), the icosahedron most closely approximates a sphere. Fuller found that the best way to lay various polyhedra flat while keeping all the landmasses unbroken was to use the icosahedron.

WHY ARE THE OCEANS BROKEN UP?

Try peeling an orange while keeping the skin in one piece. Then lay the skin out flat. Notice how it needs breaks, or "sinuses" in many different places in order to lie flat. The more breaks introduced, the flatter the orange peel will lie. When an icosahedron is unfolded and laid flat, breaks need to be introduced, just as in the case of the orange peel. The question is then where to introduce these breaks? One way of doing this is to introduce the breaks in the oceans as much as possible. This provides a world view in which the landmasses are unbroken. Fuller's map was actually designed to have all of the icosahedron's triangles separable. This allowed the map to be dynamic. By rearranging the triangles, with the South Pole at the center of the map, navigation routes by sea become readily apparent, just as air routes across the North Pole are obvious in the original configuration. Fuller explored more than 25 different configurations of the Dymaxion Air-Ocean World Map, each one breaking in different places and allowing different aspects of the world to be emphasized.

WHY ARE THE MEAN LOW TEMPERATURE ZONES SHOWN?

The Fuller Projection defines our world not in terms of political boundaries or physical features but by temperature zone. Buckminster Fuller was interested in the history of human migration and the geographical areas of technological innovation as they relate to temperature. Looking at the yellow band closest to the North Pole we find that the mean low temperature ranges from 23° to 41° Fahrenheit. Fuller found that throughout history, humans migrated east to west along the 32° freezing line and that the majority of the dominant centers of modern civilization can be found to lie somewhere within this optimum temperature band. He felt that social patterns, human preoccupations and economic customs are determined by how cold it gets, not by how hot. Buckminster Fuller then realized that: (1) the colder an area gets the larger the fluctuation in temperature is to be found, and (2) the more a geographical area's temperature varies, the more technologically inventive humans living there must become in order to survive. For example, they must learn to build boats to cross a lake in summer, as well as design sleds to cross the ice in winter.