

Democratising nations by area through small multiples

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Abstract:

In world maps, as in the majority of maps depicting geographies of larger scales, features such as continents, countries etc. are depicted according to their approximate size. In projected maps, equal area projections such as Equal Earth take the principle of size quite literally to maintain area from 3D globe to 2D map. Other types of projection like the conformal Mercator, while systematically distorting area (the well-known exaggeration towards the poles), still maintain a relative but imperfect hierarchy of area (for example, Greenland is still smaller than Asia, despite the areal distortion).

This dependency on size is an essential component of effective map communication, ensuring that the geography depicted on the map agrees with our knowledge of that geography. However, there is a bias towards larger world features being rather more well-known than the smaller ones, with recognisable shapes being a key visual component of that knowledge. The shape of the continent of South America is known by a lot of people whilst the shape of Easter Island is not (a surrealist map from 1929 with a massive “Ile de Pâques” is one of the inspirations for this). We argue for a ‘democratisation’ in the map, with each nation having a ‘vote’, that vote being expressed by equal size. It is hoped that with enough helpful cartographic cues, the small nations with unfamiliar shapes would be part of an effective map if enough context is provided.

We present a map of Oceania, perhaps one of the least recognisable parts of the world, nation-by-nation (Figure 1). Each country and dependency (with a few honourable mentions besides) is presented as a small multiple centred on the Pacific Ocean, within which the geographic area is scaled to the total land area of Oceania. This means that each land mass has an area that is a bit more than Australia’s (by far the Oceania nation with the largest area). These small multiples are placed within a main Pacific Ocean map. All maps are based on an Equal Earth projection, using 1: 10 million Natural Earth data.

The limitations of fitting 29 identically-sized small multiple maps and maintaining relative orientations between units is clear, though most relative positions have been approximately maintained. This is a first-pass map, and the next edition will address the immediate shortcomings:

- In scaling up Oceania units beyond the 1:10 million scale for which they were intended, the very smallest of countries / dependencies are very simplified, so larger scale data sources will be used (e.g. if communication by shape is the aim of this then the triangular Coral Sea Island(s) is not delivering).
- Some convergence of archipelagos has happened to make the land masses fit within the small multiple (e.g. French Polynesia is actually a lot more dispersed than the map implies). While such convergence is unavoidable within the rules of this map, it was done manually. Therefore a more systematic distortion of ocean area will be made through a cartogram algorithm such as Gastner-Newman. Then the scaled island shapes would be placed in their designated locations on the distorted grid generated. (Incidentally, cartograms could be an alternative solution to achieving the equal nation size objective.)

Returning to equal area projections, it was one of the hopes associated with the Gall-Peters projection back in the 70s and 80s that equatorial land masses, long underemphasised size-wise through the dominant Mercator projection, would become the focus of the map. This would in turn focus the world’s gaze on continents such as Africa and foster initiatives to address the human and physical problems there. In making all nations equal in terms of size, as proposed here, we are bringing unfamiliar shapes into the world consciousness. In Oceania’s case, these are the coastlines of islands, many of which may be lost to the sea by the end of the century due to climate change effects, so it is important to make those shapes well-known as a geographic and graphical focus for action.

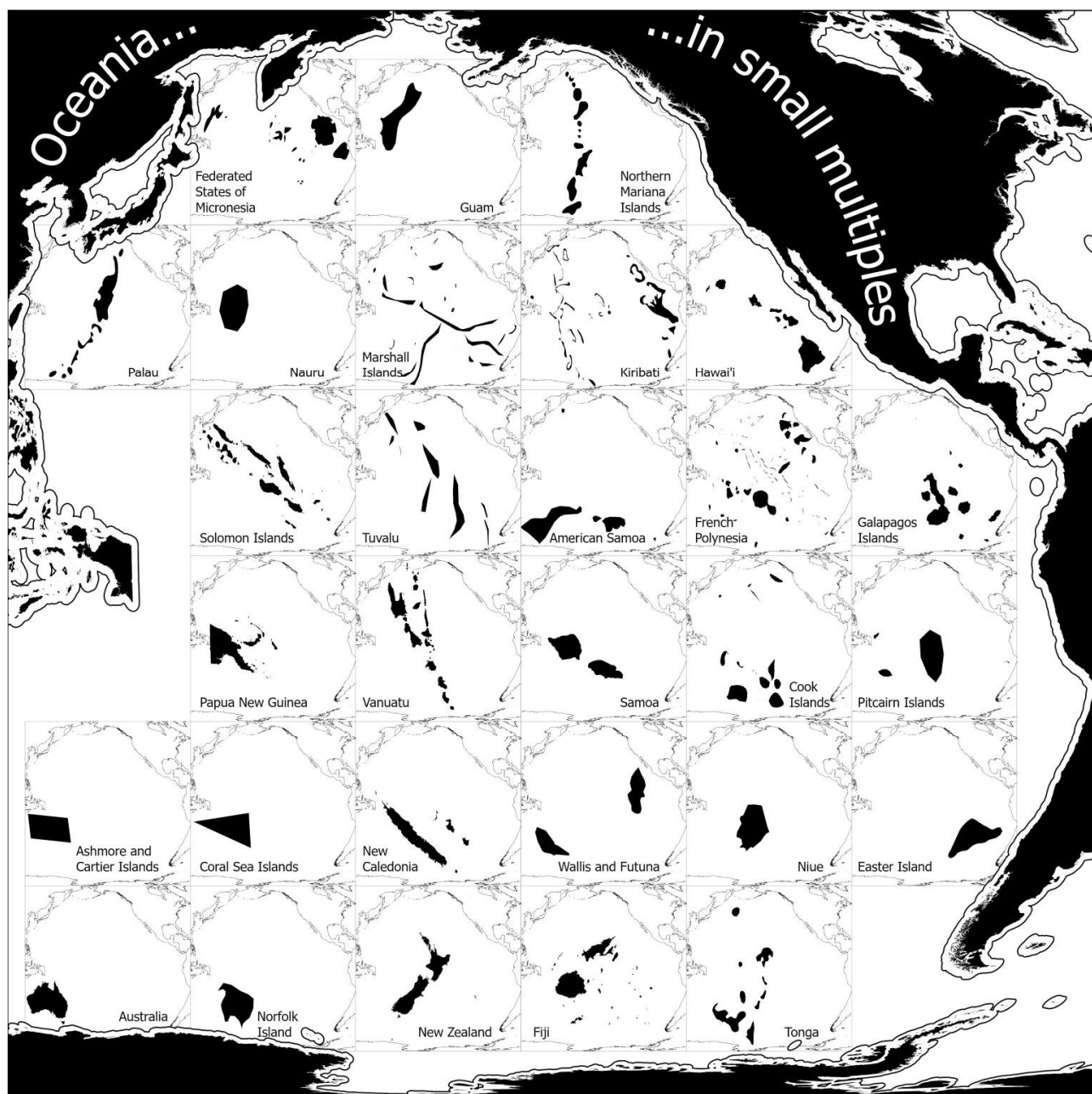


Figure 1. Oceania in small multiples.