

Website for Comparing Map Projections

Although map projections are only his hobby, Tobias Jung has set up an excellent internet website for comparing map projections of maps of the world (*Compare Map Projections* - <https://map-projections.net/>). It appeared in June 2011 and has been improved continually since then, with the addition of new contents and new projections, so that today, it covers 236 (September 2018).

The site provides various options. Individual projections can be viewed (*Single View*). For each there is a grid of meridians and parallels with a satellite image of continents and oceans. The author of each projection is given, along with the year when it was published, the group to which it belongs (for example, pseudocylindrical), its properties (for example, equivalent or compromise), other names by which it is known, and any necessary additional comments. The user can intervene in various ways – by changing the positions of the South and North Poles, or omitting the depiction of sea depths in different shades of blue.

The most valuable aspect of the website is the ability to compare any projection with any other (*Compare*). Projections for comparison can be selected in four different ways. Using

Selection Form, two windows with alphabetical lists of all the projections are available. In each window, one projection must be selected, and by clicking on *Compare Selected Projections*, a view of the two selections is shown in two colours (purple and green), one superimposed on the other, with 50% transparency. By clicking on one projection, it disappears while the other remains visible. Another click reverts to the two superimposed images. Above the superimposed images is a map of the world with a satellite image of the continents and oceans of the first selected projection, and underneath is a map of the world with the ellipses of distortion every 30° by latitude and longitude. By clicking on the name of the projection, in both cases the image can be seen in another projection.

Another mode of comparison is via *Thumbnails*, where world maps in all 236 projections are arranged in rows of five. The third mode is an alphabetical *List of Projections*. For each project, the name of the author, year, groups, properties and alternative names are given. In these modes, two projections must be chosen and by clicking *Compare Selected Projections*, the result is the same as in the first mode.

In the fourth mode, *Recommended Comparisons*, the author has suggested 111 pairs for comparison. For each projection, the name and a small map of the world is given. He has suggested pairs where it is difficult to spot the differences, and some where they are obvious, but still worth comparing. For each pair, he has provided an explanation, *Why this pairing?*

There are two ways of comparing two projections: *Simple Mode* and *Expert Mode*. In *Expert Mode*, there are two overlays of the maps, while they have the same latitude, and in *Simple Mode*, one overlay is given, mostly with the same altitude. Ellipses of distortion are given every 15° for latitude and longitude.

The *Compare Map Projections* website includes a number of texts by the author on map projections (*Articles*), particularly on *Basic Knowledge*, and several *Selected Projections*. In the section named *What's a Map Projection?* the author compares four projections of world maps (*Miller, Wagner IV, Mollweide* and *Canter's W14*) and writes, "And *none* of them is really accurate, none is wrong, none is better or worse than the others in itself. They are different, they serve different purposes, they aim to emphasise *different* aspects". The site also contains *Links* to a number of articles on map projections.

Figure 1 gives a comparison of two very similar projections recommended by Tobias Jung in *Recommended Comparisons*. These are the equalarea pseudocylindrical projection Equal Earth (2018) and a 1932 projection with almost the same properties, Wagner IV.

This website can be used when teaching about map projections and in research work when creating new projections for maps of the world and comparing them with existing projections.

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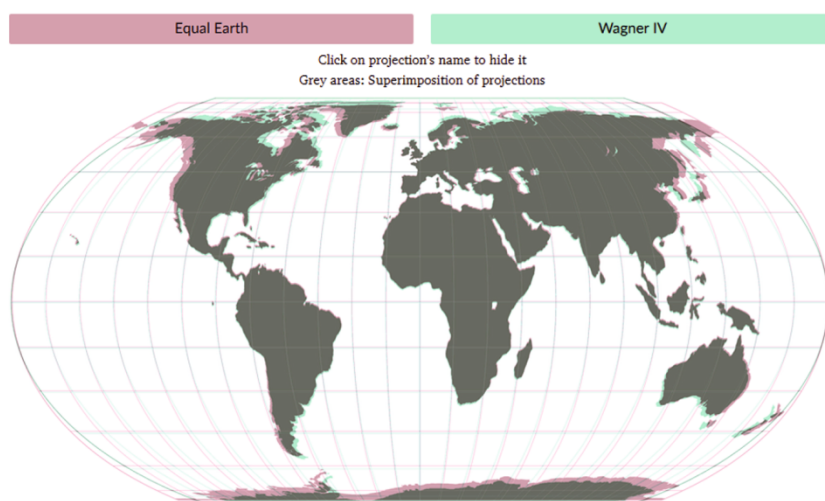


Fig. 1 Usporedba projekcija Equal Earth i Wagnerove IV.
Slika 1. Comparison of Equal Earth and Wagner IV projections

Mrežne stranice za usporedbu kartografskih projekcija

Tobias Jung, iako su mu kartografske projekcije samo hobi, postavio je na internet izvrsne mrežne stranice za usporedbu kartografskih projekcija za karte svijeta (*Compare Map Projections* - <https://map-projections.net/>). Stranice su se pojavile na internetu u lipnju 2011. i od tada su neprestano usavršavane, dodavani su novi sadržaji i nove projekcije tako da ih je danas 236 (rujan 2018.).

Strance nude razne mogućnosti. Pojedine projekcije možemo samo pogledati (*Single View*). Za izabranu projekciju dobiva se mreža meridijana i paralela sa satelitskom slikom kontinenta i oceana. Naveden je autor projekcije, godina kada je predložena, skupina kojoj projekcija pripada, npr. pseudocilindrična, njezina svojstva, npr. ekvivalentna ili uvjetna (*compromise*), druga imena pod kojima je poznata i ako je potrebno dodatne primjedbe. Korisnik ima mogućnost intervencije – može zamijeniti položaj sjevernog i južnog pola te izostaviti prikaz dubina mora različitim tonovima plave boje.

Najvredniji dio stranica je mogućnost usporedbe (*Compare*) bilo koje projekcije s bilo kojom drugom. Projekcije koje se želi usporediti može se birati na četiri različita načina. U prvom načinu (*via Selection Form*) na raspolaganju su dva prozora s abecednim popisima svih projekcija. U svakom prozoru treba izabrati jednu projekciju i klikom na *Compare Selected Projections* dobiva se prikaz u kojem su karte svijeta u dvije izabrane projekcije prikazane dvjema bojama

(ljubičasta i zelena) preklapljene jedna preko druge pri čemu jedna ima 50 postotnu prozirnost. Klikom na ime bilo koje od te dvije projekcije ona nestaje i vidljiva je samo ona druga. Ponovnim klikom opet se dobiva preklap. Iznad slike s preklapom nalazi se karta svijeta sa satelitskom slikom kontinenta i oceana prvo izabrane projekcije, a ispod slike s preklapom karta svijeta s elipsama deformacija svakih 30° po širini i dužini. Klikom na ime projekcije u oba slučaja dobiva se isto takva slika u drugoj projekciji.

Drugi način izbora za usporedbu je s pomoću sličica (*via Thumbnails*) karta svijeta u svih 236 projekcija svrstanih po pet u jednom redu. U trećem načinu ponuđen je abecedni popis svih 236 projekcija (*via List of Projections*). Za svaku je projekciju naveden autor, godina, skupina, svojstva i alternativna imena. I u ovim načinima izbora treba izabrati dvije projekcije i klikom na *Compare Selected Projections* rezultat je isti kao i kod prvog načina.

U četvrtom načinu autor je predložio 111 parova za usporedbu (*Recommended Comparisons*). Za svaku projekciju navedeno je ime i dana je sličica karte svijeta. Izabrao je parove za koje nije lako uočiti razlike, ali i neke kod koji su razlike uočljive, ali po mišljenju autora vrijedne usporedbe. Za svaki par navedeno je zašto je izabran za usporedbu (*Why this pairing?*).

Dva su načina usporedbe dviju projekcija *Simple Mode* i *Expert Mode*. *Expert mode* ima dva preklopa karta, pri čemu karte imaju i jednaku

širinu (u *Simple Mode* prikazuje se jedan preklap pri čemu karte najčešće imaju jednaku visinu). Elipse deformacija dane su svakih 15° po širini i dužini.

Stranice *Compare Map Projections* sadrže i određeni broj autorovih tekstova o kartografskim projekcijama (*Articles*), posebno o temeljnim znanjima (*Basic Knowledge*), te nekoliko izabranih projekcija (*Selected Projections*). U odjeljku pod naslovom *What's a Map Projection ?* autor uspoređujući četiri projekcije za karte svijeta (*Millerovu*, *Wagnerovu IV*, *Mollweideovu* i *Canterovu W14*) piše: „And none of them is really accurate, none is wrong, none is better or worse than the others in itself. They are *different*, they serve different purposes, they aim to emphasise different aspects.“ Stranice sadrže i poveznice (*Links*) na određeni broj tekstova o kartografskim projekcijama.

Na sl. 1 dana je usporedba dviju vrlo sličnih projekcija koju je predložio autor ovog alata Tobias Jung (*Recommended Comparisons*). Uspoređene su ekvivalentna pseudocilindrična projekcija *Equal Earth* iz 2018. s projekcijom gotovo istih svojstava iz 1932., *Wagnerovom IV*.

Opisane mrežne stranice mogu se primijeniti u nastavi kartografskih projekcija i u istraživačkom radu pri kreiranju novih projekcija za karte svijeta i njihovoj usporedbi s postojećim projekcijama.

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