Description

travel_time_to_ports_x (x ranges from 1 to 5)

The value of each pixel is the estimated travel time to the nearest port in 2015. There are 5 data layers based on different port sizes.

x in file name	Port size	Number of ports
1	Large	160
2	Medium	361
3	Small	990
4	Very small	2,153
5	*Any*	*3,778*

Additional Information

Format

Raster Dataset, GeoTIFF, LZW compression

Unit

Minutes

Data type

Byte (16 bit Unsigned Integer)

No data value

65535

Flags

None

Spatial resolution

30 arc seconds

Spatial extent

Upper left	-180, 85
Lower left	-180, -60
Upper right	180, 85
Lower right	180, -60

Spatial Reference System (SRS)

EPSG:4326 - WGS84 - Geographic Coordinate System (lat/long)

Temporal resolution

2015

Temporal extent

Updates may follow for future years, but these are dependent on the availability of updated inputs on travel times and city locations and populations.

Methodology

Travel time to the nearest port was estimated using an accumulated cost function (accCost) in the gdistance R package (van Etten, 2018). This function requires two input datasets: (i) a set of locations to estimate travel time to and (ii) a transition matrix that represents the cost or time to travel across a surface.

Marine ports were extracted from the 26th edition of the World Port Index (NGA, 2017) which contains the location and physical characteristics of approximately 3,700 major ports and terminals. Ports are represented as single points

The transition matrix was based on the friction surface (https://map.ox.ac.uk/research-project/accessibility_to_cities) from the 2015 global accessibility map (Weiss et al, 2018).

The R code used to generate the 5 travel time maps is included in the report "A suite of global accessibility indicators for sustainable rural development" (Nelson, 2019) that can be downloaded with these data layers.

References

NGA. World Port Index 26th edition.
(2017). https://msi.nga.mil/NGAPortal/MSI.portal?_nfpb=true&_pageLabel=msi_portal_page_62&pubCode=0015

Nelson, A. A suite of global accessibility indicators for sustainable rural development. (2019) A report prepared for the CGIAR Consortium for Spatial Information

Weiss, D. J. et al. A global map of travel time to cities to assess inequalities in accessibility in 2015. Nature (2018). doi:10.1038/nature25181

van Etten, J. gdistance: Distances and Routes on Geographical Grids. (2018). https://cran.r-project.org/package=gdistance