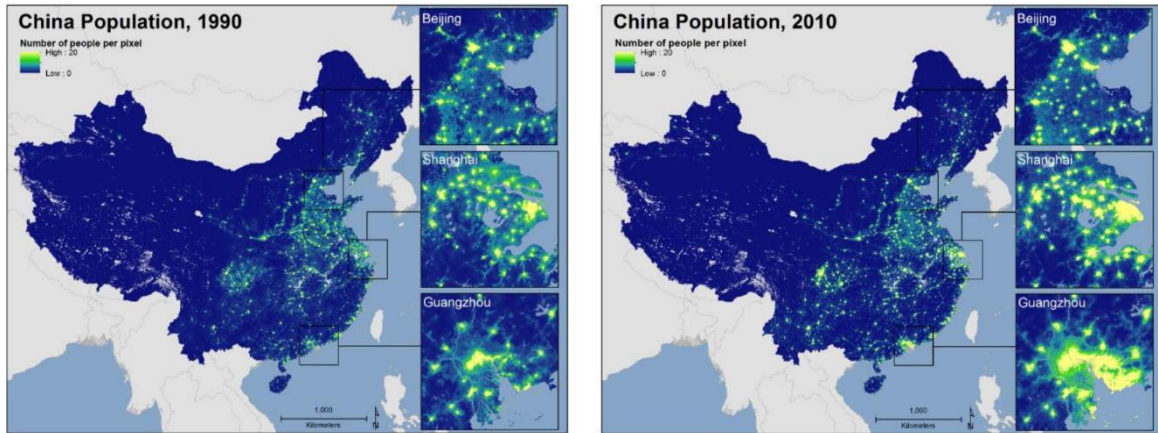

WorldPop – Population Counts



WorldPop population change mapping for China, showing predicted population density for each 100m x 100m grid square for (left) 1990 and (right) 2010 (Source: WorldPop)

Product Category

- | | | | |
|--|---|---|---|
| <input checked="" type="checkbox"/> Land Use | <input type="checkbox"/> Natural Disaster | <input type="checkbox"/> Coast Management | <input type="checkbox"/> Earth's Surface Motion |
| <input type="checkbox"/> Land Cover | <input type="checkbox"/> Climate Change | <input type="checkbox"/> Marine | |

Financial Domain(s)

- Investment management Risk analysis Insurance management Green finance

User requirements

UN10: Need to understand population density when making investment decisions
 UN57: Automatically update changes in population density estimates based on observable land use changes

Description

Investment managers must consider population density at a localized level when formulating investment strategies. Analysing population density within smaller geographical areas provides valuable insights into consumer demand, market opportunities, and growth prospects for particular regions or sectors. This data aids in evaluating the feasibility and potential profitability of their investment choices. Conventional data sources for population density are often outdated and lack the granularity required for precise targeted interventions. Moreover, continuously tracking populations can pose difficulties, especially in low- and middle-income nations facing resource constraints, conflict, or dealing with terrain landscapes. WorldPop, a project based on the University of Southampton, and dedicated to mapping global populations. It complements conventional population data sources by incorporating dynamic data spanning from 2000 to 2020, with a high spatial resolution of 100 meters, to map the distribution of human populations. The overarching objective is to guarantee that every individual, regardless of their location, is included in the decision-making process. One important layer of these is the confidence level which gives information about the error interval associated with each grid cell.

Spatial coverage target

Districts within a city

Data throughput

- | | | |
|-------------------|-------------------------------|---|
| Rapid tasking | <input type="checkbox"/> High | <input checked="" type="checkbox"/> Low |
| Data availability | <input type="checkbox"/> High | <input checked="" type="checkbox"/> Low |
-



Product specifications	
Main processing steps	<p>WorldPop generates high resolution global population density maps by using machine learning algorithms to correlate available census surveys for certain years with many other sources of data including geospatial data. The idea is to generate population grid maps which are continuous in time and space. The geospatial data used to generate these maps is categorised into raster and vector data. The raster data includes EO data such as elevation, slope, vegetation types, accessibility to major cities, land use and land cover maps, nighttime light, temperature, and precipitation data.</p> <p>The population maps are generated using two different techniques called bottom-up and top-down, each of these techniques has advantages and disadvantages and the investment manager can choose any of them based on their needs. For more information about these techniques and how the maps are generated, you can open this link https://www.worldpop.org/methods/populations/. In addition to the EO data, the population maps are generated using geospatial data like Open Street Map (OSM) to calculate the distance to important features such as roads water bodies, hospitals, etc.</p>
Input data sources	<p>Optical: land use and land cover maps, vegetation types, temperature and precipitation maps.</p> <p>Radar: Elevation, Slope</p> <p>Supporting data: Census data, settlement data, OSM</p>
Accessibility	Optical and SAR VHR imagery: commercially available on WorldPop – population count is publicly and freely available through the University of Southampton.
Spatial resolution	100 m & 1 km
Frequency (Temporal resolution)	Annual
Latency	N.A
Geographical scale coverage	Globally
Delivery/ output format	Data type: Raster File format: GeoTIFF
Accuracies	Thematic accuracy: varies by the region. Spatial accuracy: 1.5-2 pixels of input data
Constraints and limitations	<ul style="list-style-type: none"> ■ WorldPop data is available at a relatively high spatial resolution (often 100 meters) and is dynamic from 2000 to 2020. However, for some applications, even higher resolution and more recent data may be required. ■ The accuracy of population estimates relies on multiple factors, including the quality of input data, the assumptions made in modelling, and validation against ground truth data. Errors can occur, especially in areas with limited ground data for validation. ■ There can be a lag between the actual population changes and the availability of updated WorldPop data, as it is not real-time information. However, this can be overcome by calculating the maps by an EO provider with the same methodology as WorldPop.
Level of skills required by users to use the EO service	Skills: Essential Knowledge: Essential