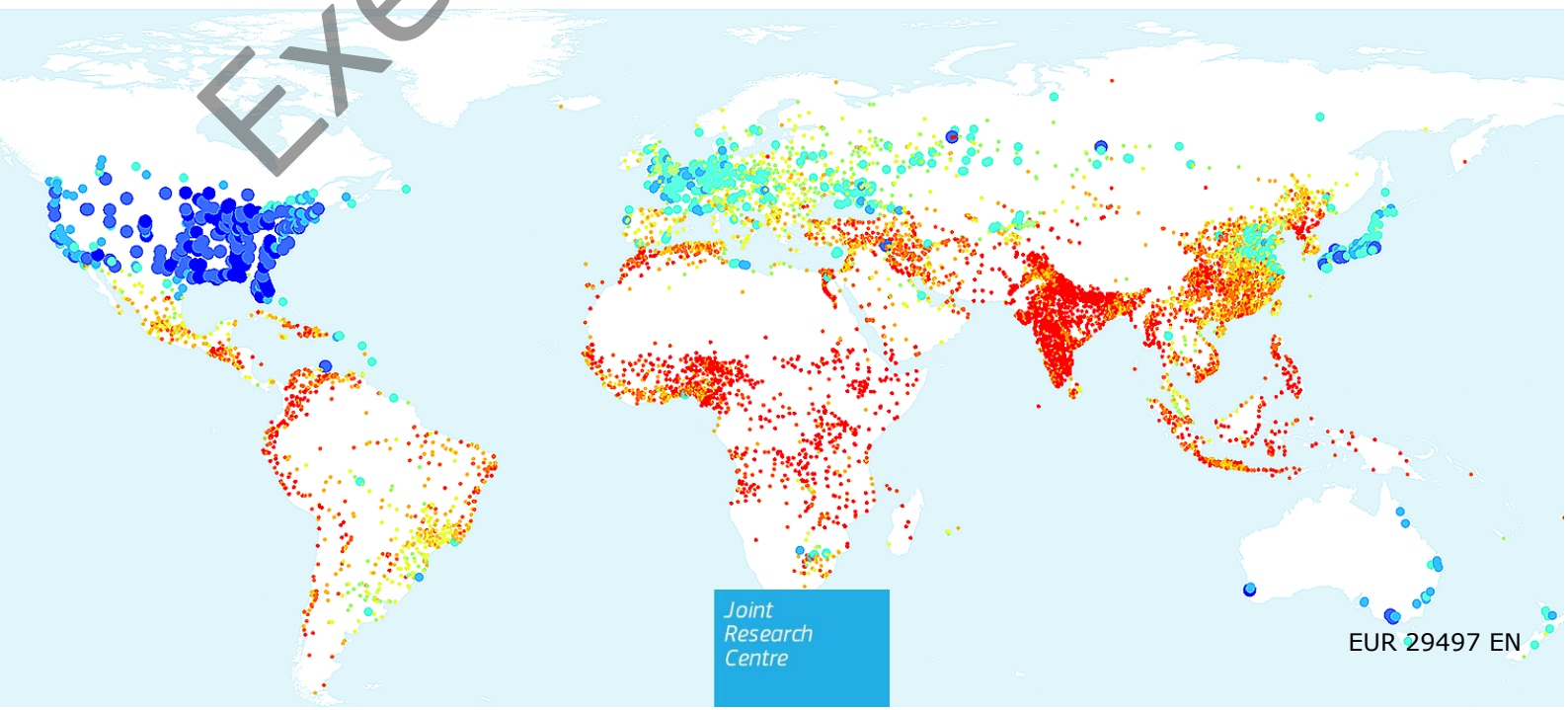JRC SCIENCE FOR POLICY REPORT

Atlas of the Human Planet 2018

A World of Cities

2018

Executive summary

The 2018 edition of the *Atlas of the Human Planet* is dedicated to the *World of Cities*. The urban areas are today home to more than half of the world's seven billion people and their share will increase rapidly for years to come. However, there is a gap in the global monitoring of the urbanization process and all its dimensions. Until today, there is no globally harmonised definition of cities and settlements, which would be important for international comparability of cities. This Atlas uses a globally harmonised definition and presents the first globally consistent *Urban Centre Database (UCDB)[1]*. The database combines the city location (name) with the city extent (surface, shape), and describes each city with a set of geographical, socio-economic and environmental attributes, many of them going back 25 or even 40 years in time.

Policy context

The *Atlas of the Human Planet 2018* contributes directly to the voluntary commitment to develop a global, people-based definition of cities and settlements[2]. The definition is essential for monitoring of progress in achieving the goals of the 2030 Agenda for Sustainable Development[3]; several of the indicators linked to this goal are highly sensitive to where the boundary is drawn around a city. This Atlas is based on the UCDB, which provides harmonised city-level information for city networks like the Covenant of Mayors[4], and as such supports also the implementation of the New Urban Agenda[5].

For the Sendai Framework for Disaster Risk Reduction 2015-2030 (DRR)[6], the findings related to the exposure of cities to disasters will be included in the UN Global Assessment Report on Disaster Risk Reduction (GAR)[7], which is the flagship report of the United Nations on worldwide efforts to reduce disaster risk.

The *Atlas of the Human Planet 2018* is also a deliverable to the GEO (Group on Earth Observations) Human Planet Initiative[8]. The initiative maximises the use of (big) open data through artificial intelligence (AI) to bring EO data in the socio-economic and other domains. By developing a new generation of measurements and information products, the initiative provides new scientific evidence and a comprehensive understanding of the human presence on the planet that can support global policy processes with agreed, actionable and goal-driven metrics.

Key conclusions

The focus on the urban centres used in this edition of the *Atlas* was possible thanks to the voluntary commitment of the EU, OECD, World Bank, FAO, and UN-HABITAT to develop a global harmonised definition of cities and settlements. Applying this definition globally changes our perception on urbanisation, and therefore the partner of the commitment believe this definition is essential for a number of policy areas beyond this Atlas. In particular, the Sustainable Development Goals will profit from the better comparability of indicators.

The *Urban Centre Database (UCDB)* is a prime example of open, coordinated and sustained data sharing, as proposed by the Group on Earth Observations (GEO). The *Atlas* and the UCDB demonstrate that the combination of open data sets can generate new information. The new

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[1] https://ghsl.jrc.ec.europa.eu/ucdb2018Overview.php
[2] https://ec.europa.eu/eurostat/cros/content/about_en
[3] https://sustainabledevelopment.un.org/post2015/transformingourworld
[4] https://www.covenantofmayors.eu/en/
[5] http://habitat3.org/the-new-urban-agenda/
[6] https://www.unisdr.org/we/coordinate/sendai-framework
[7] https://www.unisdr.org/we/inform/gar
[8] https://www.earthobservations.org/activity.php?id=119

technology used for generating the Global Human Settlement Layer (GHSL) products allows producing global, yet locally consistent data for local action at the city level. However, the uptake of the data by decision makers for local, national or global reporting requires a regular update of the information, which could be achieved for example through integration of products in the portfolio of the EU's Copernicus space programme.

Main findings

Although the discussions on the final definition of cities and settlements are ongoing, it is clear that the degree of urbanisation will change our view on urbanisation. With the current implementation of the Definition, the global degree of urbanisation reaches 81%, of which 48% of the population live in urban centres. The analysis derived from the UCDB highlights very diverse spatial development patterns across cities, regions of the world and income groups. Large population growth produces moderate increases in built-up surfaces for urban centres located in low-income countries, while moderate population growth produces large increases in built-up surfaces for UC located in high-income countries. Most of the urban centres expand over soils with a high agricultural suitability, posing important challenges and responsibilities to careful use of soil resources. Urban centres in Asia, Africa and Oceania have more than half of their urban population living below the global average night-time illumination value, threatening access to opportunities, decent housing and adequate standards of living. Urban centres concentrate more than 40% of the global population, in many of them people and assets are exposed to natural hazards. Especially in Asia and Africa, the increase in people exposure is due to natural population increase. Some continents are more exposed than others to certain hazards. For example, the number of urban centres exposed to storm surge in Asia is higher than the total number of urban centres in all the other continents combined. The GHS-UCDB can be of direct relevance to support policy as it offers baseline information for Sustainable Development Goals indicators to quantify the efficiency in the use of land and the generalised access to green areas.

Related and future JRC work

At the centre of the GHSL framework is the understanding of the planet aligned with the JRC space strategy. The project supports several Knowledge Centres[9] (Disaster Risk, Territorial Policies, Migration and Demography). The GHSL project is one key test cases of the Joint Research Centre Earth Observation Data and Processing Platform (JEODPP). The processing power and storage of JEODPP are essential for the success of GHSL, which relies on artificial intelligence approaches applied to global fine scale data sets.

The UN Statistical Commission is expected to vote on the global definition in 2020. In the run-up to the vote, the GHSL project supports the partners of the commitment (OECD, World Bank, FAO, and UN-HABITAT) with the promotion of the definition in the UN member states through workshops and pilot applications.

Following the successful test of the fitness for purpose the JRC, together with the Directorate-General for Regional and Urban Policy (DG REGIO) and Directorate-General (DG) for Internal Market, Industry, Entrepreneurship and SMEs (DG GROW), are working towards an integration of GHSL products based on Sentinel-1 and Sentinel-2 in the Land Service of the Copernicus programme.

Quick guide

The *Atlas of the Human Planet* 2018 is based on the UCDB, which relies on the GHSL data. GHSL combines satellite and socio-economic data to produce high resolution, global open information on built-up area and population. In the current release, it covers the epochs 1975,

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[9] https://ec.europa.eu/knowledge4policy/

1990, 2000 and 2015. The data sets are used in combination with socio-economic data sets to understand, where and in which built environment people live, and how the settlements and the population change over time. This knowledge is used in policy areas including environmental impact assessment, disaster risk assessment, transport, health care services, education, natural disasters and hazards and urban planning.

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