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TAKING THE PULSE OF OUR PLANET FROM SPACE

EUMETSAT ECMWF EUSPA

Understanding Human Settlements with free and open data: the GEO Human Planet Initiative

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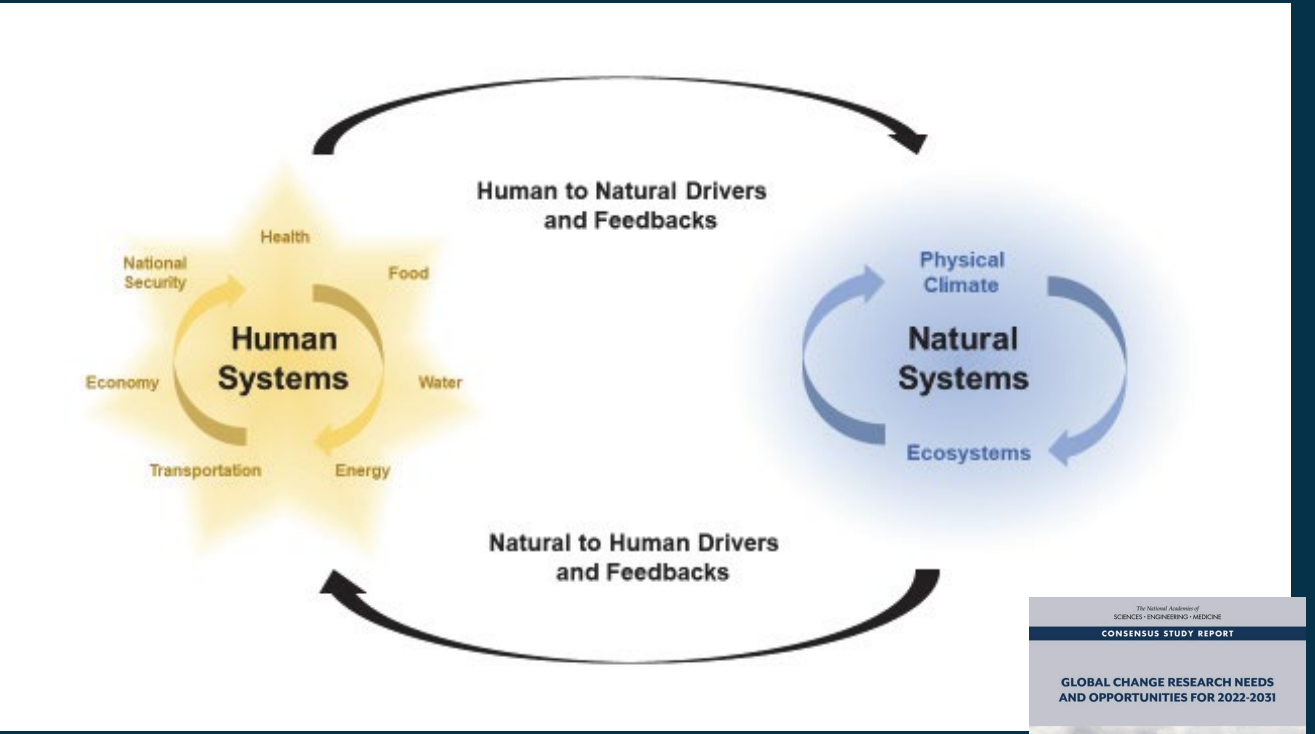
24 May 2022

The GEO Human Planet Initiative (HPI)

- Human and natural systems are closely coupled
- Dynamic integration of human and environmental data is essential
- HPI has focused on using EO to improve mapping and modeling of human settlements, infrastructure, and population – now and in the future – in support of diverse applications



https://www.nap.edu/catalog/26055/global-change-research-needs-and-opportunities-for-2022-2031

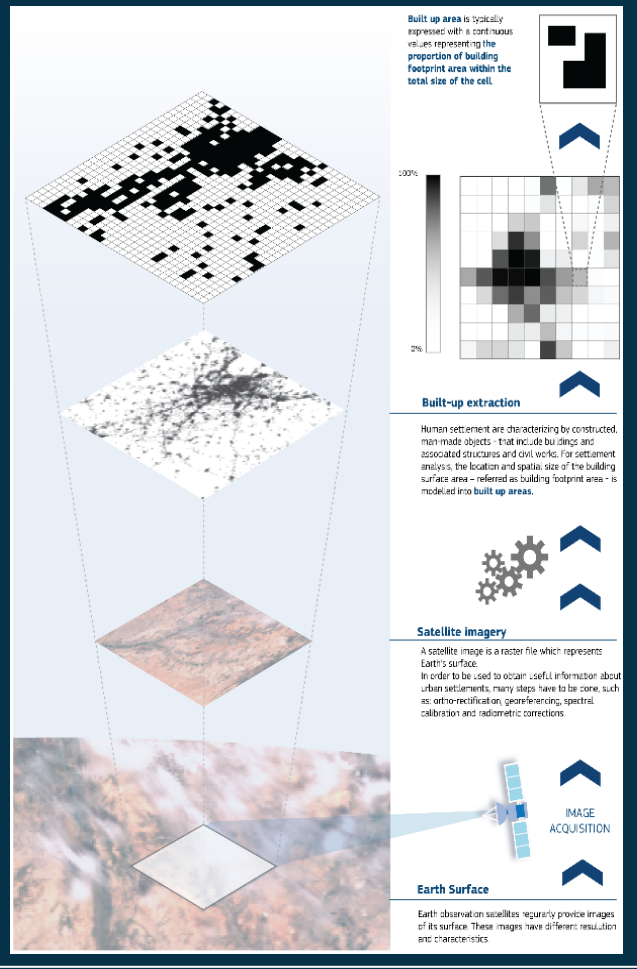
From HPI Data to Open Knowledge

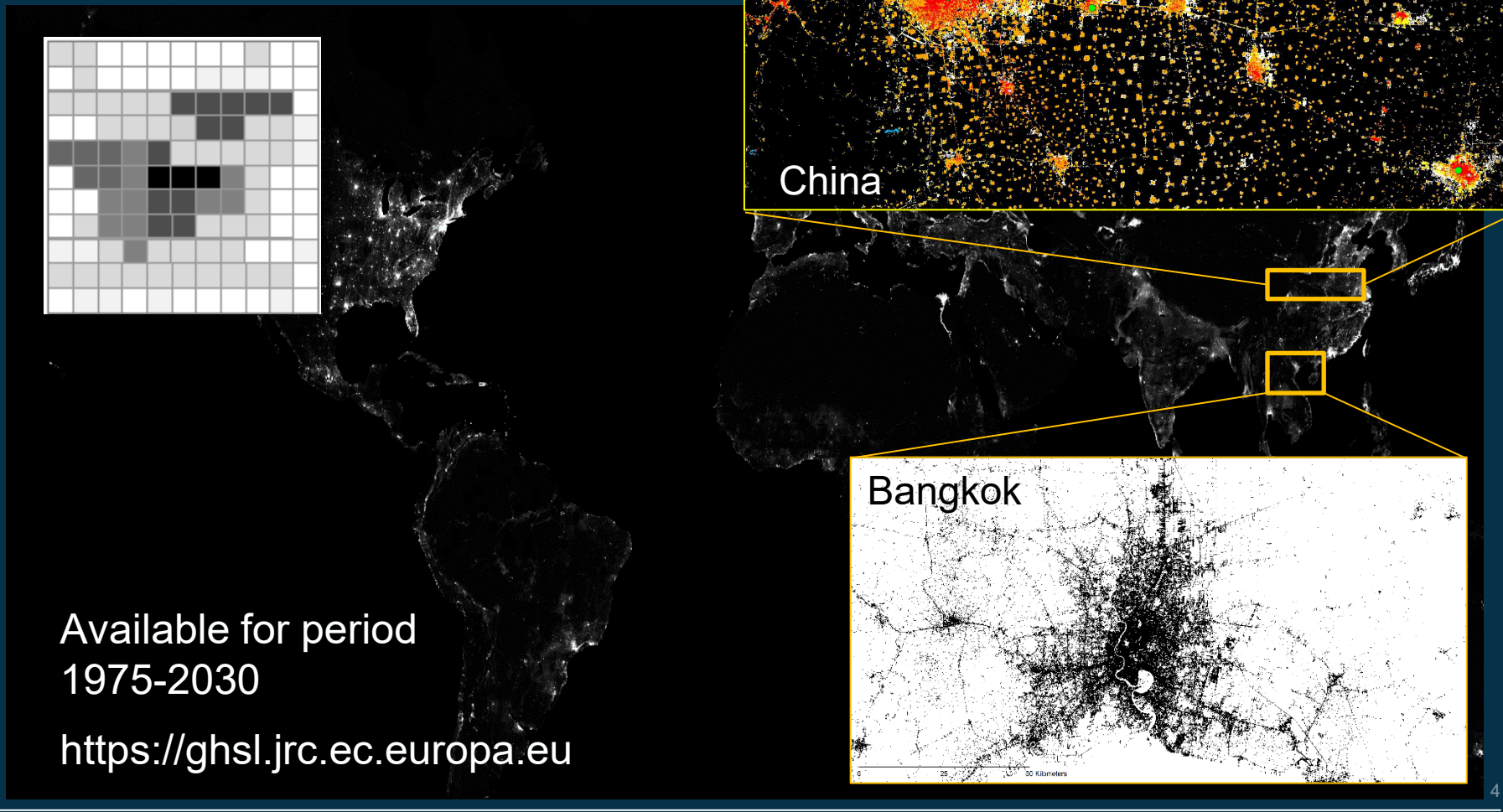
To make decisions, people need specific **data** about who is affected and who can take action.

They need detailed **information** about available data, models, and predictions and their associated uncertainties and limitations.

They need trustworthy **open knowledge** about how both human and environmental systems will evolve and respond over time and across space to complex stresses.

HPI Data: Built Up Areas

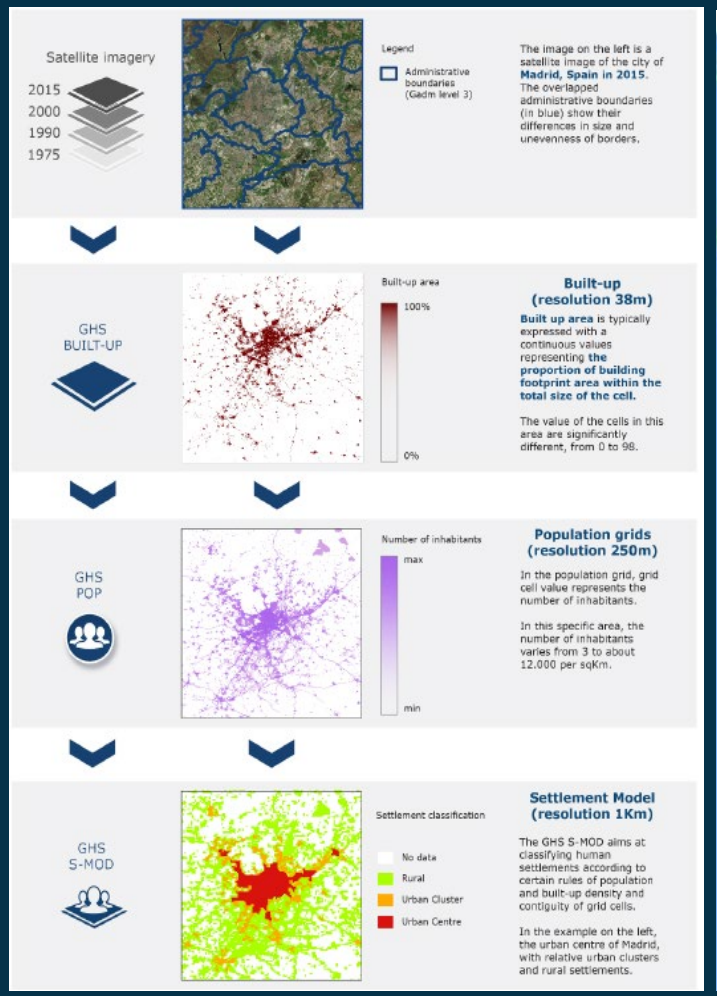


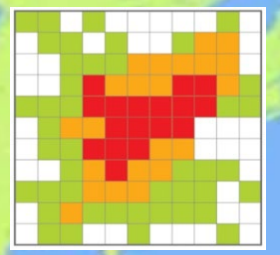


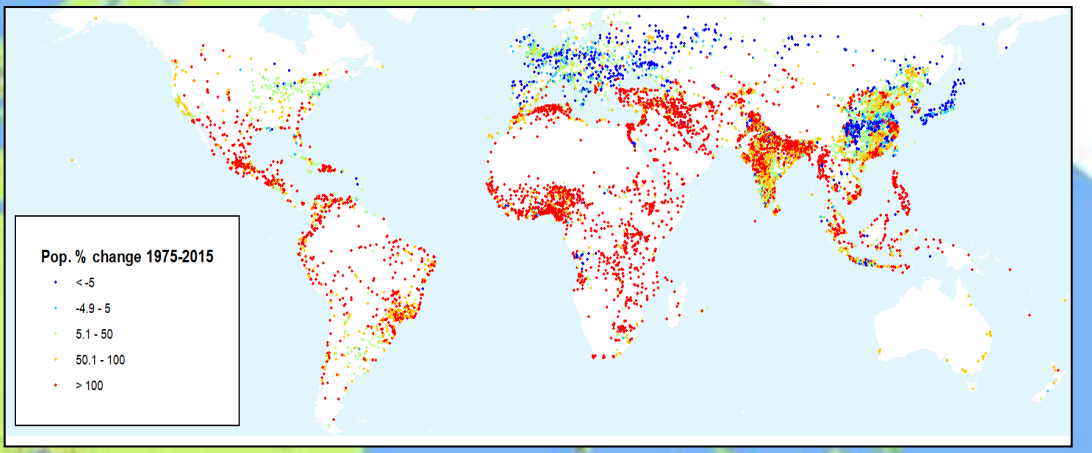
Available for period
1975-2030

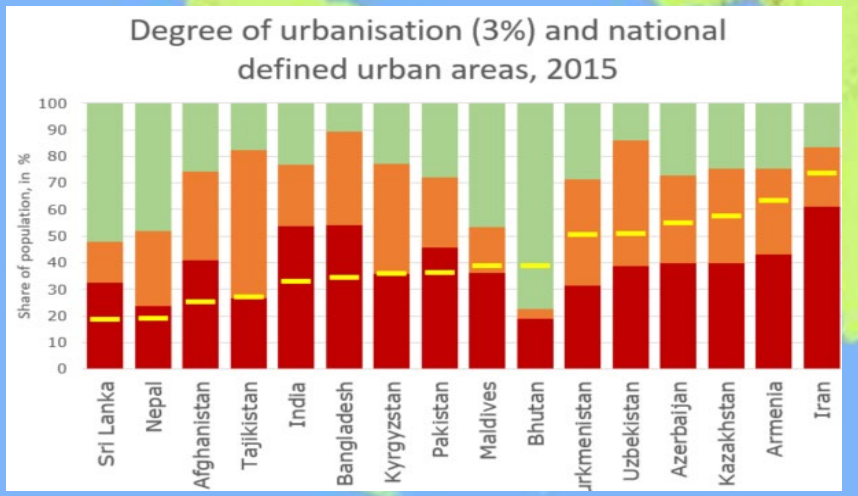
https://ghsl.jrc.ec.europa.eu

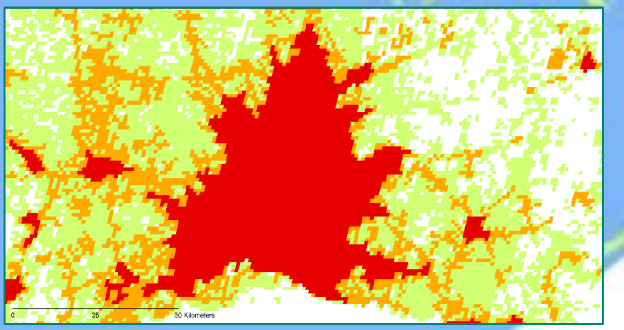
HPI Data: Settlement Classification











Degree of Urbanisation – a harmonised definition of cities, urban & rural areas

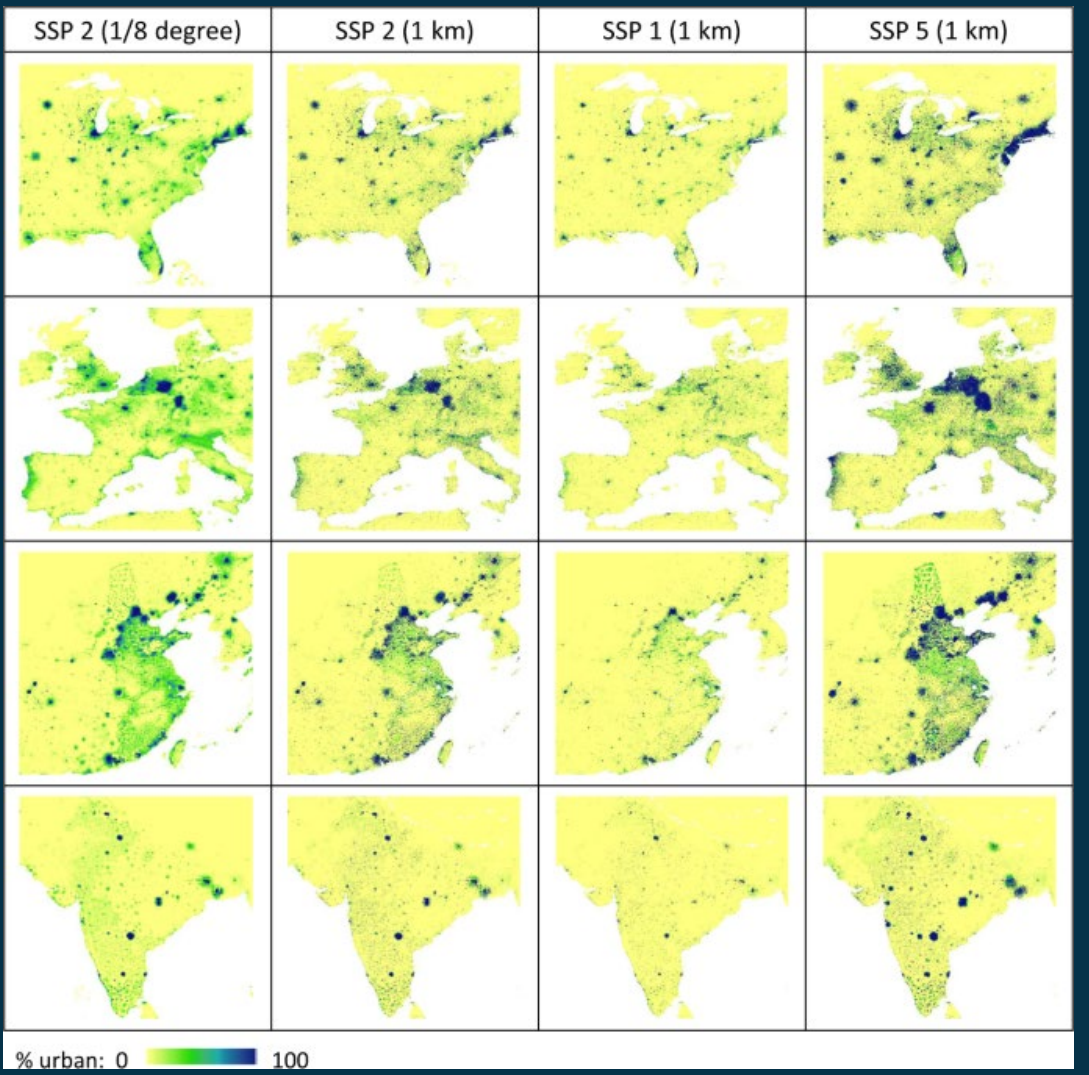
HPI Information: Future Urban Land Scenarios

Global 1-km Downscaled Urban Land Extent Projection and Base Year Grids by SSP Scenarios, v1 (2000–2100)

Global spatial urban land fraction data consistent with the Shared Socioeconomic Pathways (SSPs) for the base year 2000 and projections at ten-year intervals for 2010-2100 at a resolution of 1-km

Inputs from Global Human Settlement Layer (GHSL) developed by JRC

Gao, J. and M. Pesaresi. 2021. *Scientific Data* 8(1): 281. https://doi.org/10.1038/s41597-021-01052-0.

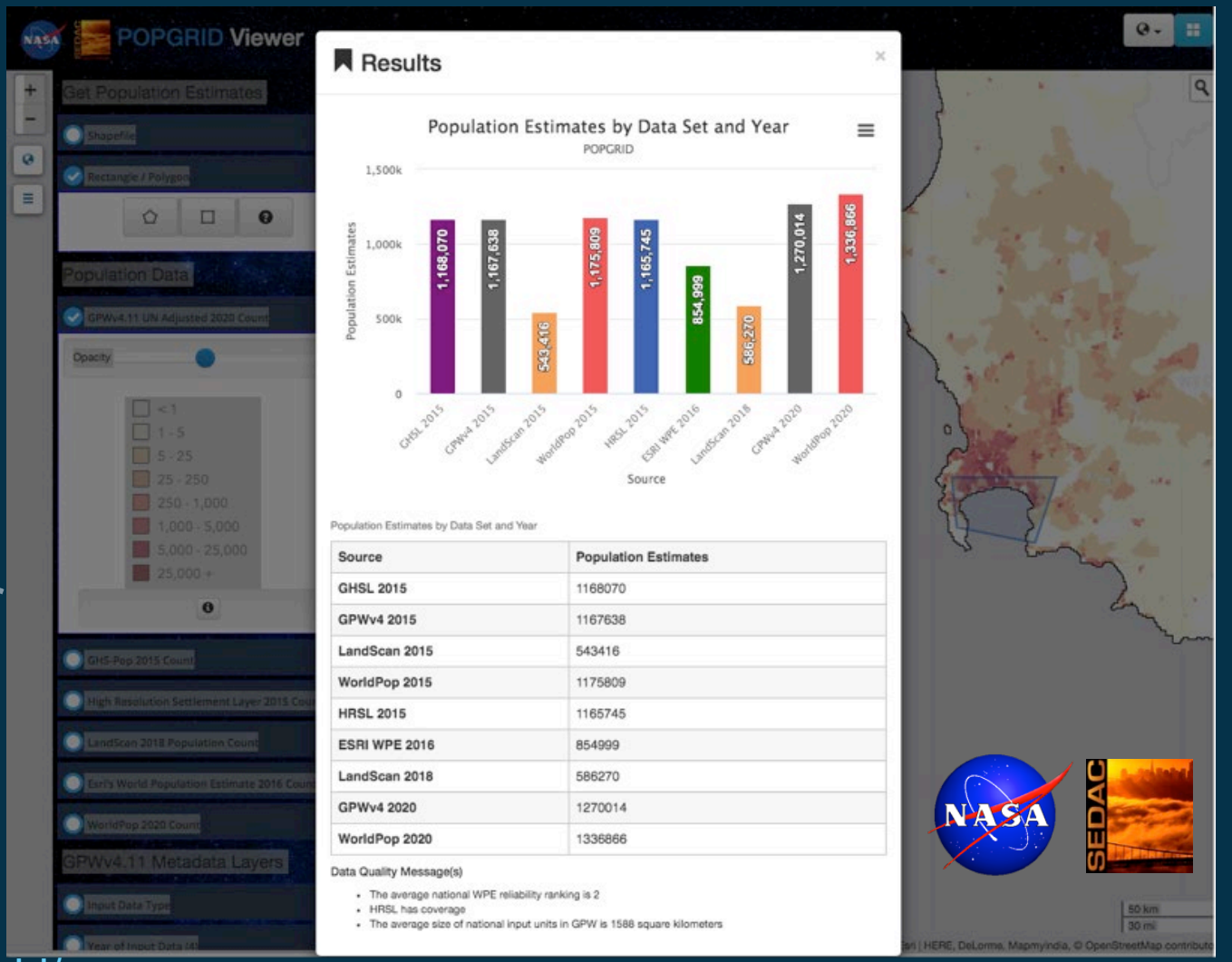


HPI Information: Comparing Population Data

There are now a variety of sources of gridded population data, based on different data sources and models of population distribution

Users often don't know which data products are appropriate for their application, and what uncertainties exist in available estimates

SEDAC's POPGRID Viewer facilitates intercomparison of data for user-defined areas of interest



https://sedac.ciesin.columbia.edu/mapping/popgrid/

HPI Open Knowledge Examples

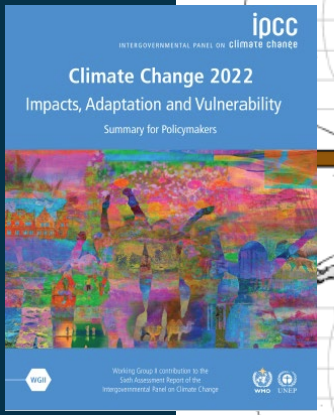
IPCC 6th Assessment Report, WG II

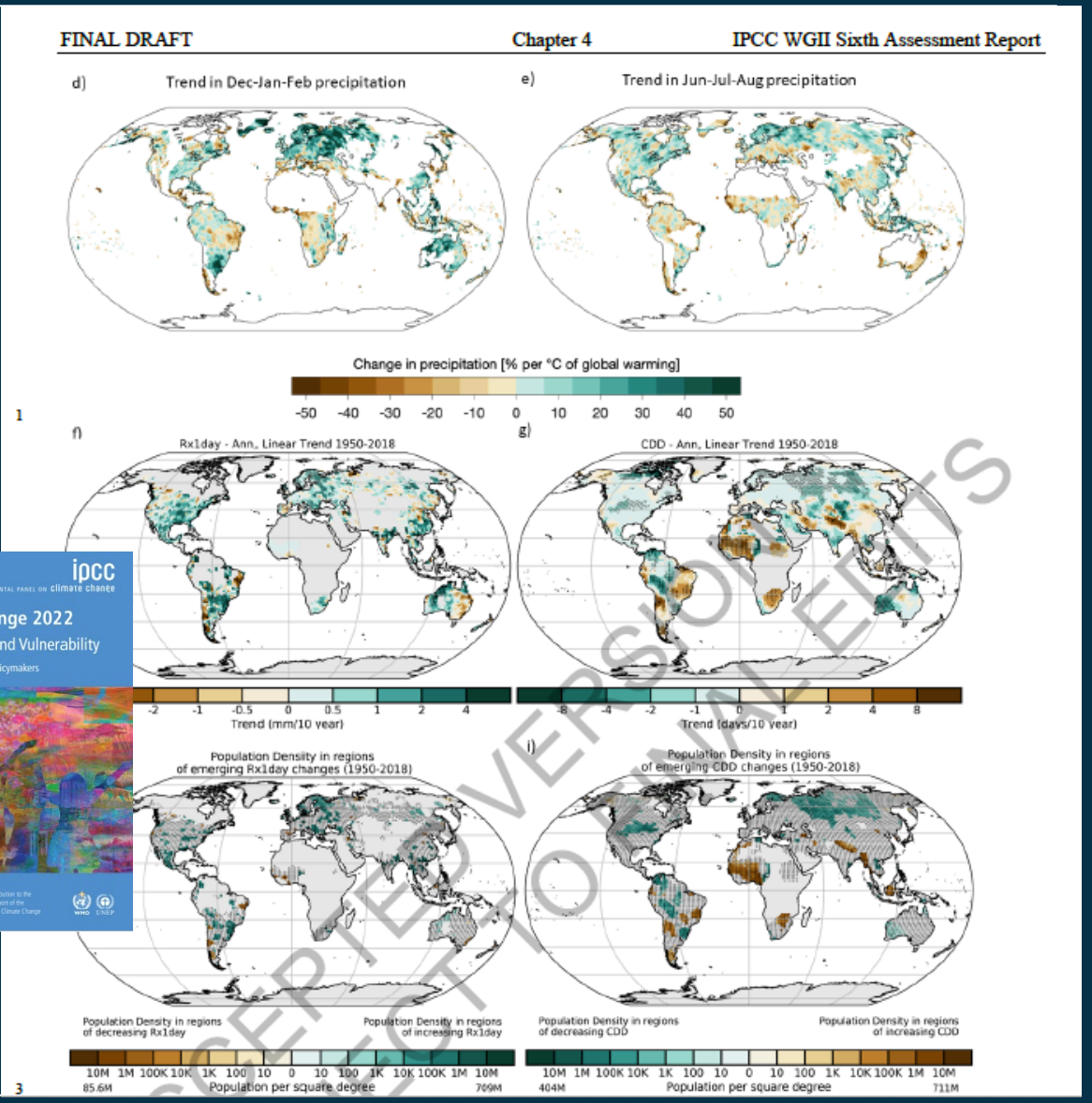
Climate Change 2022: Impacts, Adaptation and Vulnerability

Figure 4.3, “Observed mean and extreme precipitation, and people experiencing the emergence of historically unfamiliar precipitation and changes in extreme precipitation”

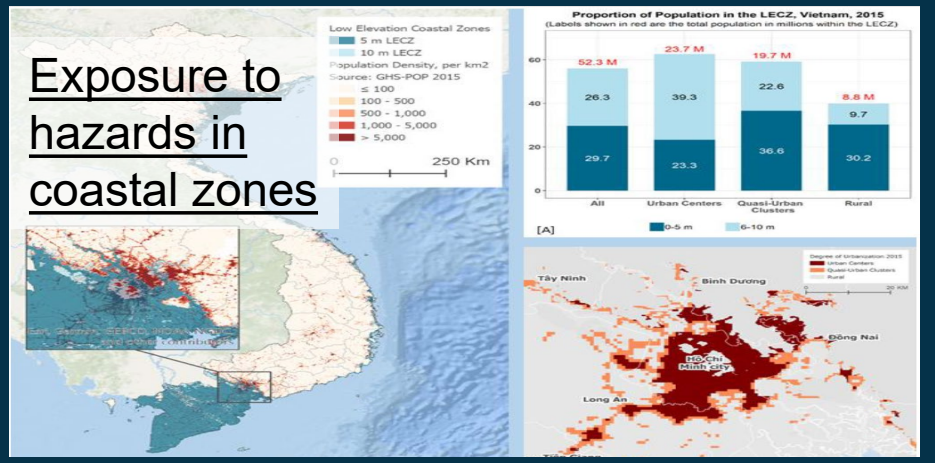
- Based in part on SEDAC’s Gridded Population of the World (GPW) data

https://ipcc-data.org/data_catalogue.html

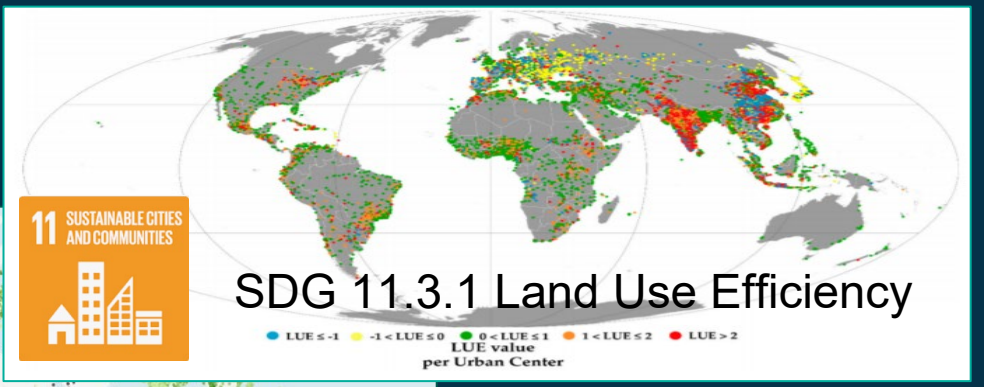




HPI Open Knowledge Examples

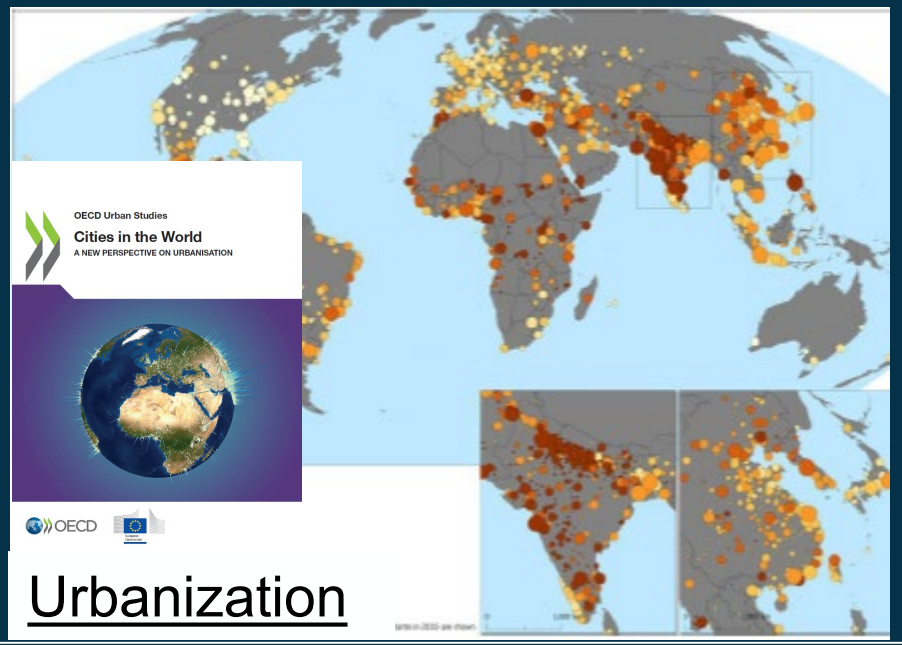


Exposure to hazards in coastal zones

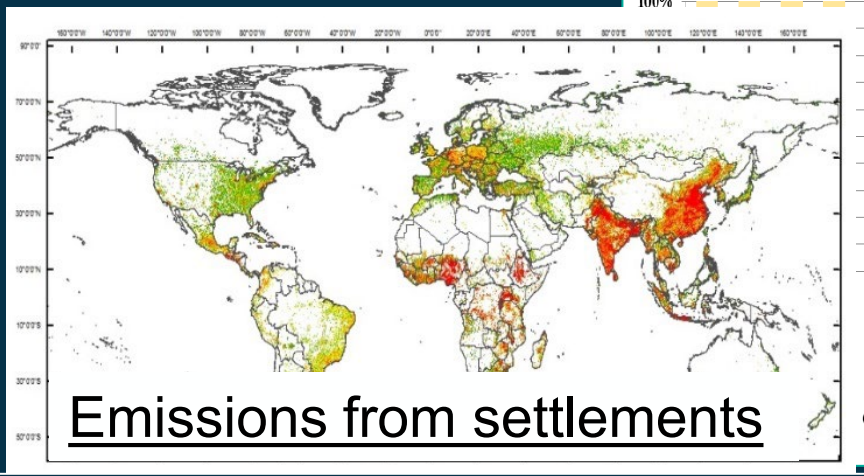


SDG 11.3.1 Land Use Efficiency

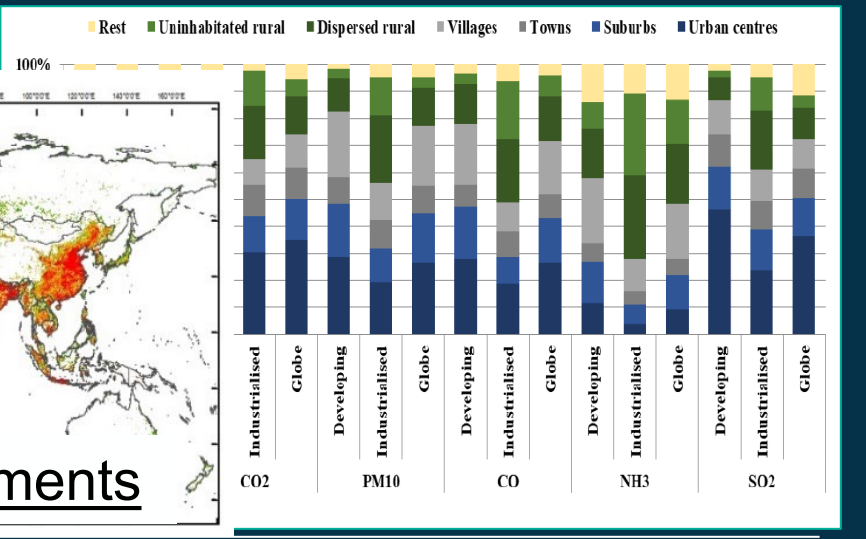
SDG 11.7.1 Green spaces



Urbanization



Emissions from settlements

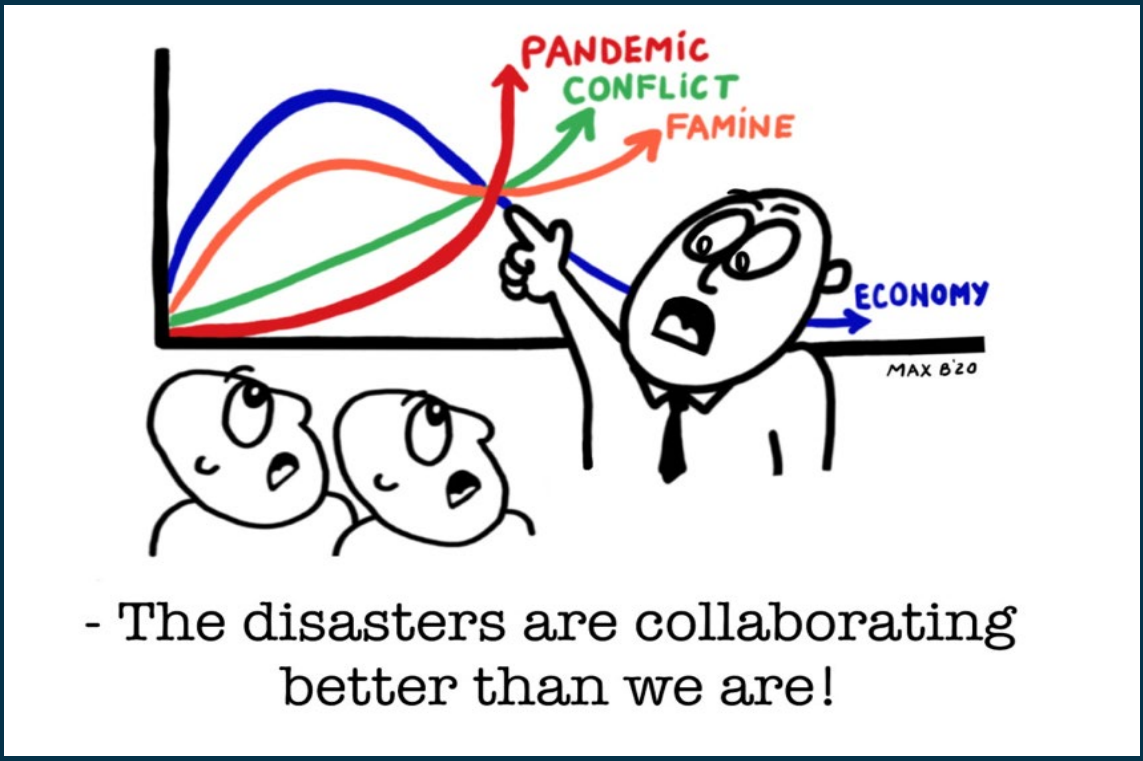


Knowledge Hub challenges

Open knowledge	HPI data are open and reproducible, HPI provides both the products and the tools to re-create those products (whenever possible).
Challenges	Societal challenges focus on understanding human processes and the interplay with natural processes. Socio and demographic variables are difficult to get and HPI contributes to fill data gaps.
Benefits	HPI products focus on socio and demographic variables that are “essential” to address current local and global challenges. Variables can be used by other GEO projects to address GEO engagement priorities.
Engagement	HPI needs to obtain feedback and use cases from practitioners and policy makers on how to make HPI data, information, and knowledge more useful, usable, and timely.

HPI Plans: Building on the GKH

- Expand the range of HPI Knowledge packages to encompass more diverse topics and application areas
- Engage the HPI community more directly in using the GKH as an open knowledge resource for building visibility and interlinkages
- Facilitate integration of HPI data, tools, and services with those of other GEO initiatives, flagships, and regional initiatives via the GKH and other interfaces such as the EO4SDGs Urban Toolkit and the DRR WG risk portal



Paul Bisca: https://twitter.com/pmbisca?lang=en