

# Gridded Population of the World (GPW) version 5: Building and using a global collection of subnational data

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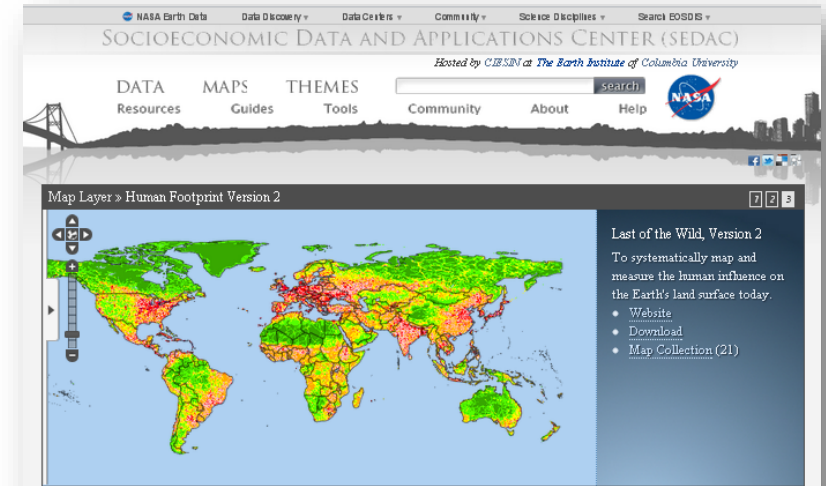
# Socioeconomic Data & Applications Center (SEDAC)

Integration of social and earth science data, especially with remote sensing

Focus on human dimensions of environmental change

Direct support to scientists, applied and operational users, decision makers, and policy communities

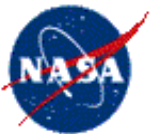
Strong links to geospatial data community



Featured Uses More Featured Uses... News More News...

This block contains a collage of several data visualization tools and reports from SEDAC. On the left, there is a "Treaty Multiple Status Matrix" table. In the center, there is a large map of Africa titled "Africa THE HUMAN FOOTPRINT". On the right, there are several smaller maps and reports, including "Another Way to Look at an Air Quality Problem", "World Resources Report: Decision Making in a Changing Climate", "We are Seven Billion", "Percentage of population living below 200% of the poverty level", and "Population Density Grid, v1 (1990, 1995, 2000)".

Country	Protocol for the implementation of the Alpine Convention in the field of mountain agriculture	Protocol for the implementation of the Alpine Convention in the field of nature protection and landscape conservation	Protocol for the implementation of the Alpine Convention in the field of low country planning and sustainable development
Austria	Party	...	...
EC European Communities	Party	Signatory	Signatory
France	Party	Signatory	Signatory
Germany	Party	Signatory	Signatory
Italy	Signatory	Signatory	Signatory
Liechtenstein	Party	Signatory	Signatory
Monaco	...	Signatory	Signatory



# Outline



Gridded Population of the World (GPW)

Methods and data

Applications and collaborations

Improvements in version 5

New applications

Integrating versions

# Gridded Population of the World (GPW)

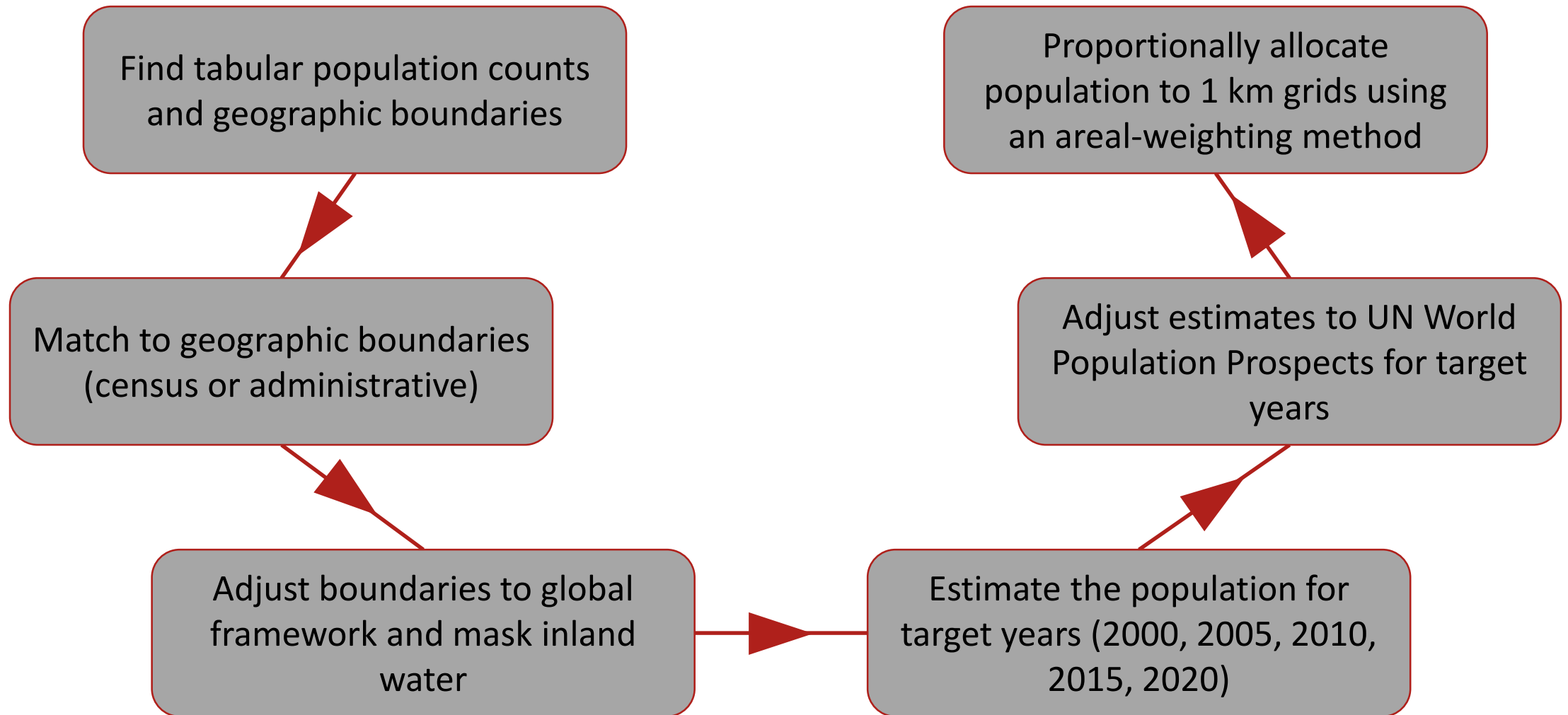
Global population grid (raster) developed to provide a spatially-disaggregated population layer that is compatible with data sets from social, economic, and Earth science fields.

Input data: census population counts and census geography

Census population data are transformed from their native spatial units to a global grid of quadrilateral latitude-longitude cells (Balk et al. 2010)

Free and openly available

# Methods



# Version 4 and 5 datasets

Global population count and density rasters

Version 4: 2000, 2005, 2010, 2015, 2020

Version 5: 2010, 2015, 2020, 2025, 2030

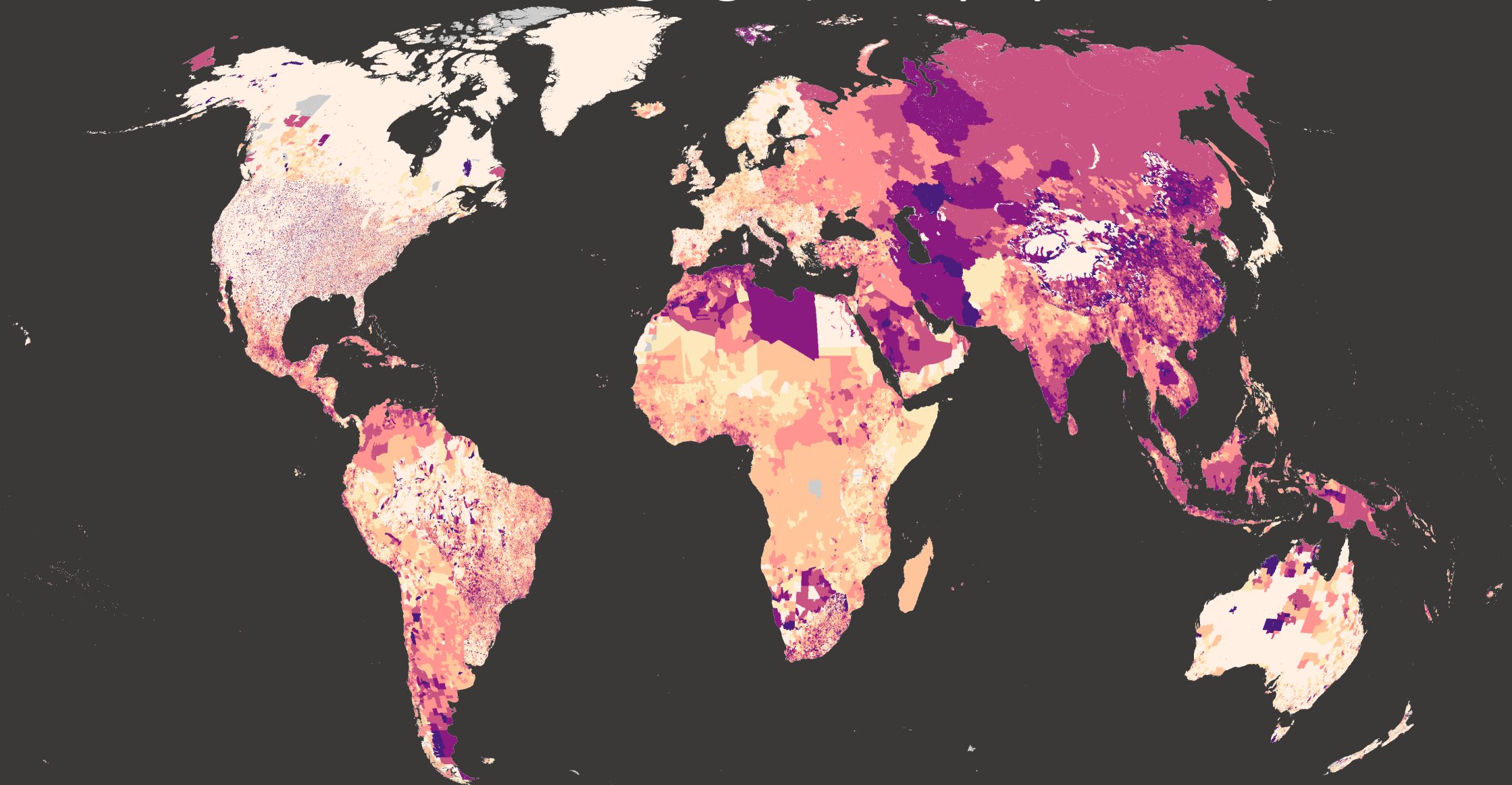
Demographic characteristics for 2010 (version 4) and 2020 (version 5)

5-year age groups crosstabbed with sex

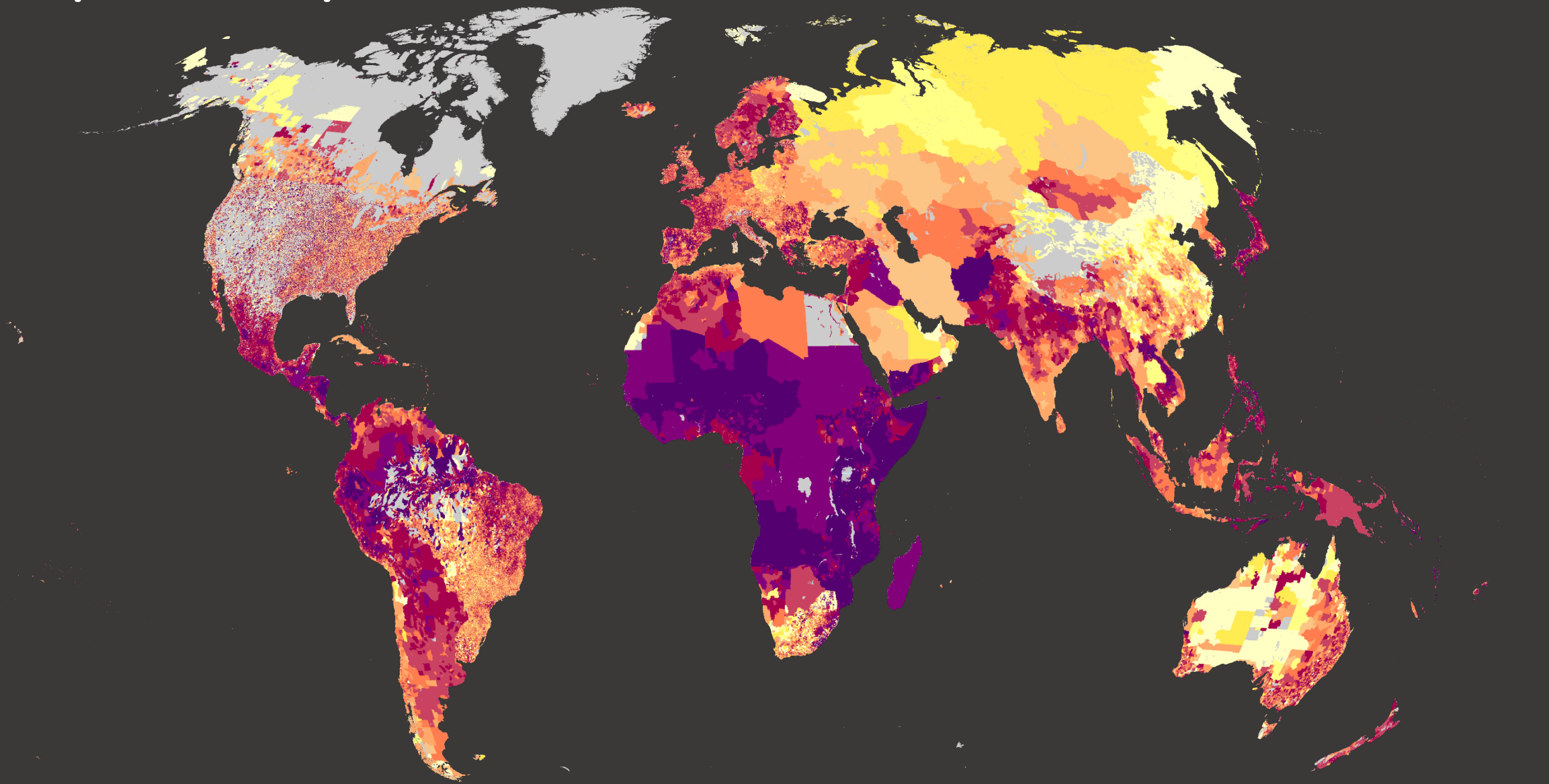
5 resolutions available: 30 second, 2.5 minute, 15-minute, 30 minute, 1 degree

Flexible aggregations and calculations possible

# Women of childbearing age (% of population)

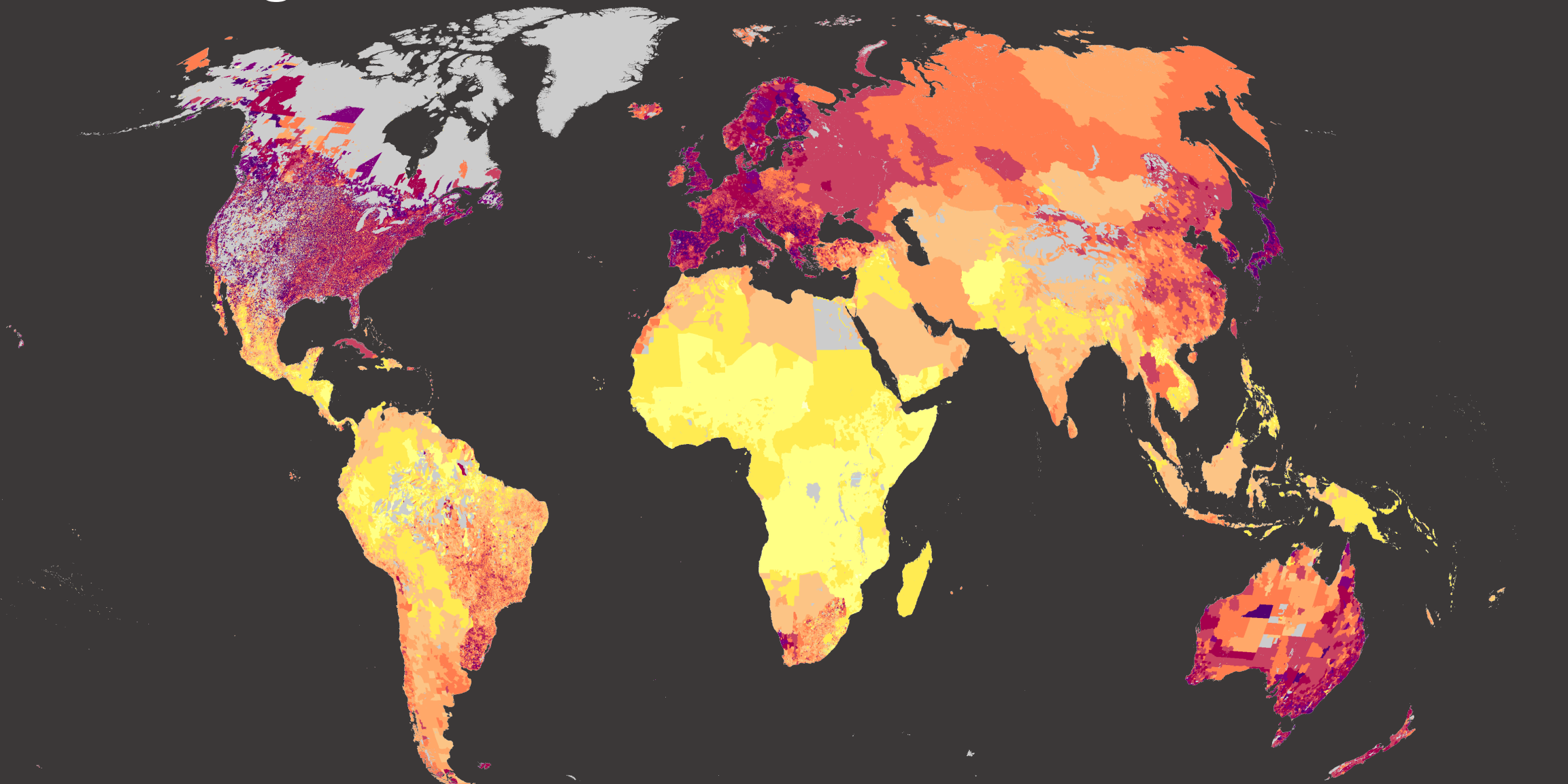


# Dependency ratio

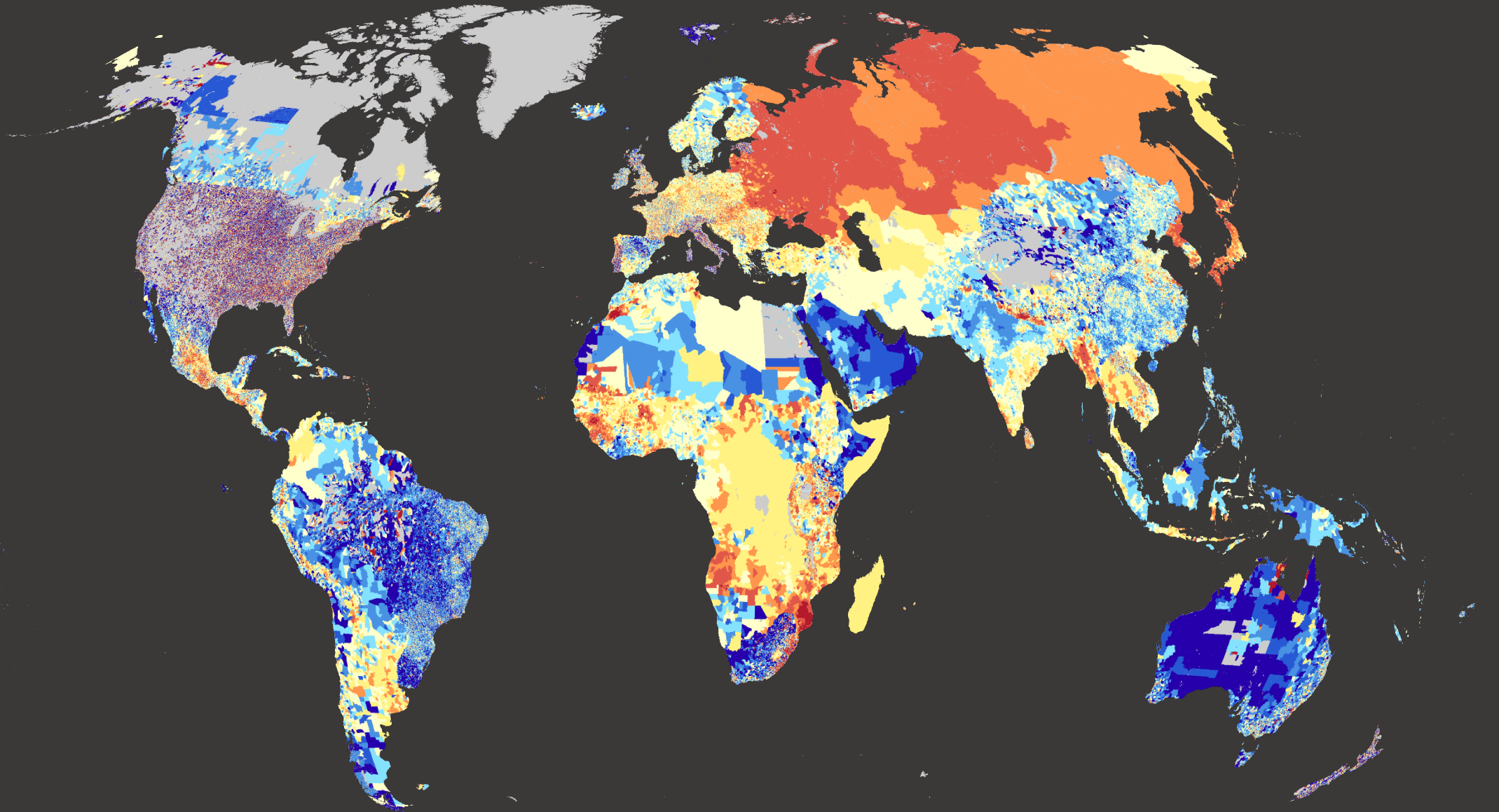




# Median age



# Sex ratio



# GPW Applications

Broad use in research, policy making, communications, and human and environmental problem-solving

Often combined with satellite remote sensing or other biophysical data

Areas of application:

Health dimensions of environmental change

Vulnerability mapping

Disaster impacts



Contents lists available at [ScienceDirect](#)

**Health & Place**

journal homepage: [www.elsevier.com/locate/healthplace](http://www.elsevier.com/locate/healthplace)

**Spatial and social factors drive anemia in Congolese women**

Jane P. Messina<sup>a,\*</sup>, Kashamuka Mwandagilirwa<sup>b</sup>, Steve M. Taylor<sup>c,d</sup>, Michael Emch<sup>e,f</sup>, Steven R. Meshnick<sup>c</sup>

 CrossMark




*Journal of Biogeography (J. Biogeogr.)* (2009) **36**, 2264–2278

**ORIGINAL ARTICLE**

**Establishment success of invasive ring-necked and monk parakeets in Europe**

Diederik Strubbe<sup>\*</sup> and Erik Matthysen




**Environmental Toxicology and Chemistry**

Hazard/Risk Assessment

**Worldwide estimation of river concentrations of any chemical originating from sewage-treatment plants using dilution factors**

Virginie D.J. Keller<sup>1</sup>, Richard J. Williams<sup>1</sup>, Caryn Lofthouse<sup>2</sup> and Andrew C. Johnson

Issue

 OPEN

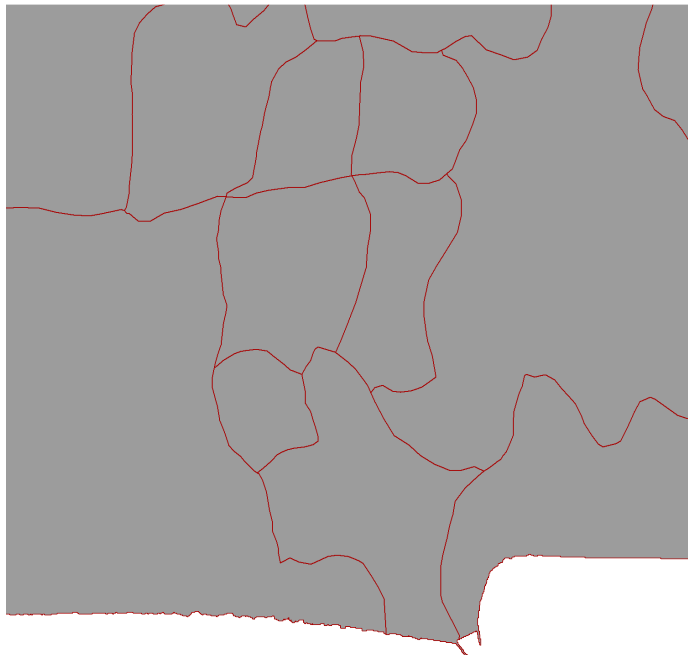
# GPW Collaborations

Allocation of census population within census boundaries

GHS-Pop

High Resolution Settlement Layer

Worldpop



Census boundaries



GPWv4



HRSL

# The POPGRID Data Collective

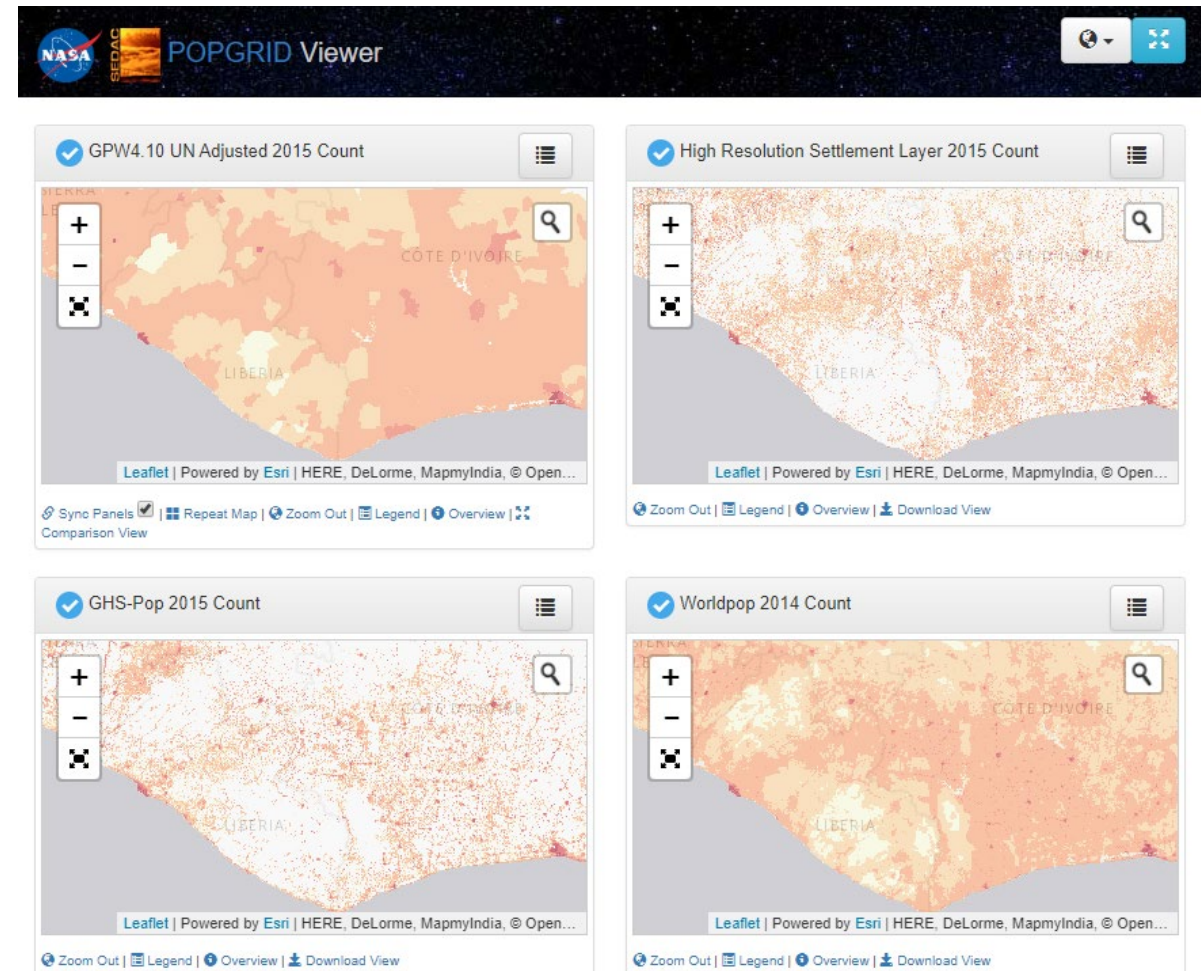
Better access to data and documentation

Share resources

Guidance for appropriate data use and interpretation

Validation and intercomparison

Coordination of tools



# Improvements in version 5

## Additional household variables

Number of households

Number of dwellings

Household size

## Urban/rural designation

## Likely improvements to spatial resolution



	Release year	Number of input units
GPWv1	1995	19,000
GPWv2	2000	127,000
GPWv3	2005	400,000
GPWv4	2015	13,500,000
GPWv5		?

# Additional applications of version 5

New household variables allow for new applications

Daytime vs. nighttime population

Distinguish residential and commercial built up areas

Better modeling within census units

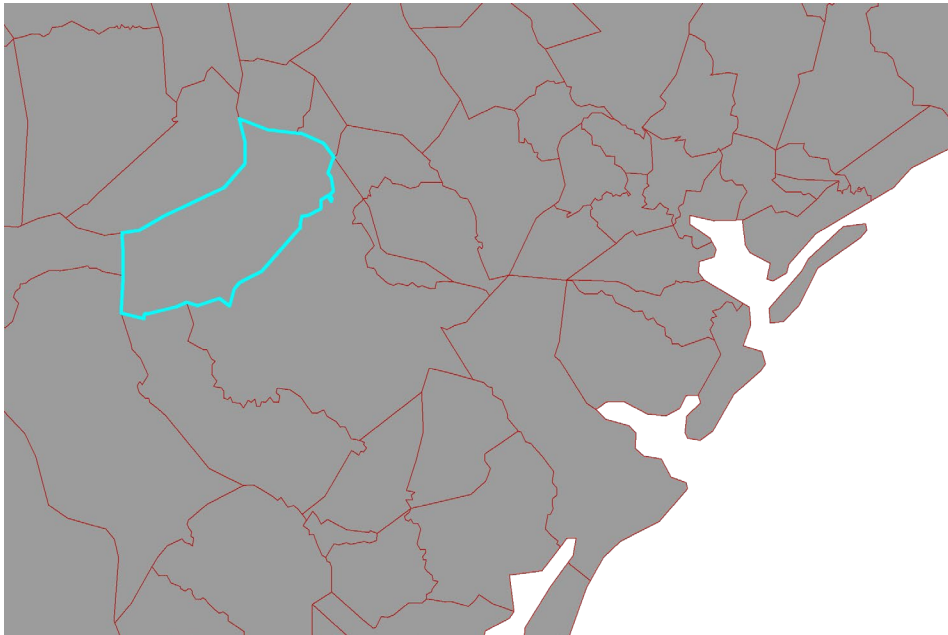


# Integration of versions 4 and 5

Have to be integrated at the polygon (vector) level

Administrative boundary or name changes

Different resolution



**GPWv3**



**GPWv4**



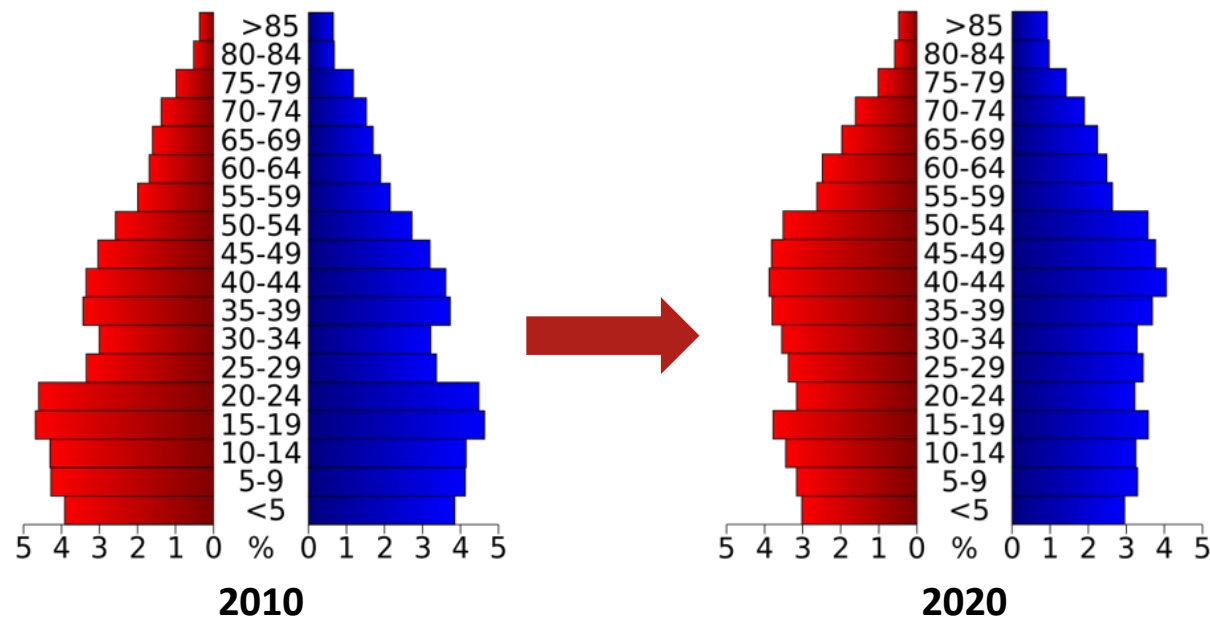
# Applications

Improve growth rate calculations

Forecast age structure

Better track changes in SDGs and humanitarian efforts over time

Investigate changing age structures





Thank you!

Questions?

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