



## OpenGeoEdu Exercise: Advanced Measure and detection of changes in settlement and population density



### Spatial level:

Any administrative levels (city/municipality, district, spatial planning region, federal state, national)

### Problem

The change in built-up settlement and population density is one of the elementary parameters for spatial planning, for decision support, but also for planning evaluation (impact assessment). Therefore, the efforts need to consider the quantification, visualization and interpretation in the spatial and temporal dimension.

The current density information can be used, for example, to compare it with original plans (planning evaluation) or to detect hotspots of change. This can be used to support decision-making in planning or plan evaluation.

The Basic Exercise introduces density mapping and visualization options. Here we list some topics for independent work. You are welcome to supplement these with your own ideas.

- Identify hotspots of building and population density.
- Detect and quantify changes in building density.
- Validate the density maps with other services (e.g. IÖR-Monitor Raster from 2000).
- Compare planning documents with the real development.
- Visualize and publish the results as online map services.

### Note:

An example for the application of the GHSL data set for planning evaluation can be found here:

XIE, X., HOU, W. & HEROLD, H. 2018. [Ex Post Impact Assessment of Master Plans—The Case of Shenzhen in Shaping a Polycentric Urban Structure](#). *ISPRS International Journal of Geo-Information*, 7, 252.

If published, please consider the following references:

- Pesaresi, M.; Ehrlich, D.; Florczyk, A.J.; Freire, S.; Julea, A.; Kemper, T.; Soille, P.; Syrris, V. [GHS Built-Up Grid](#), Derived from Landsat, Multitemporal (1975, 1990, 2000, 2014). European Commission, Joint Research Centre (JRC): Brussels, 2015.
- European Commission, Joint Research Centre (JRC); Columbia University, Center for International Earth Science Information Network (CIESIN). [GHS Population Grid](#), Derived from GPW4, Multitemporal (1975, 1990, 2000, 2015); European Commission, Joint Research Centre (JRC): Brussels, 2015