21) Name: allocation to grid cell based on number of residents, number of houses or residents per sewerage unit

Description

The Netherlands Pollutant Release and Transfer Register (PRTR) uses four allocation maps based on population or housing density. These are all grid maps with a cell size of 500x500 meter:

- Overall population density in the Netherlands
- Population density outside urbanized areas
- Sewerage units map
- Average natural gas consumption per neighbourhood

The Key Register for Addresses and Buildings (‘BAG’) forms the basis of the overall population density map (figure 21a). This key register contains the coordinates of all addresses (street name, house number, sub-number and postal code) in the Netherlands. The Land Registry Office (‘Kadaster’) supplies this database to RIVM. A geographical information system (GIS), overlays these coordinates with a map of municipal boundaries (coming from CBS, Statistics Netherlands) and a 500*500m grid cell map. This gives the number of address coordinates per municipality per grid cell. As a last step, the number of residents per municipality according to CBS is allocated to the address coordinates. For example: 50000 inhabitants and 25000 address coordinates gives an average of 2 inhabitants per address, so a grid cell with 10 coordinate points ‘receives’ 20 inhabitants.

From the map mentioned above, the population density outside urbanized areas (figure 21b) is derived within GIS by ‘clipping’ the urbanized areas from the overall population density map. The urbanized areas are based on a land use map from CBS.

The sewerage units’ map (figure 21c) indicates the type of sewer system through which the wastewater of the residents of the corresponding area ultimately reaches the surface water. A distinction is made between six types of housing and four types of sewerage units. Address coordinates, municipality boundaries, grid cell boundaries and sewerage units are overlaid and combined with the CBS data so that for each address coordinate, number of residents, housing type, sewer system, grid cell and municipality are known.

CBS provides a map depicting the average natural gas consumption per household on a neighbourhood basis. When overlaid with the number of houses per 500*500m grid cell, derived from the BAG, this results in a distribution of emissions resulting from residential combustion, cooking (gas based) and warm water supply (figure 21e).
Example map 21a: Overall population density

Example map 21b: Population density, rural areas
Example map 21c: residents, mixed sewer system

Example map 21d: non-detached single-family houses, year of construction 1970-1990
Example map 21e: total average natural gas consumption through residential heating, cooking and warm water supply (red and orange colours indicate higher energy consumption)

Institutes involved
RIVM
CBS

Currency of distribution basis data
Data on houses and numbers of residents: 2011
Sewerage unit map: 2003
Data on natural gas consumption: 2010

Background documents
Land Registry (with some general information on BAG)
http://www.kadaster.nl/web/english/Annual-report/Products-and-services/Acquisition-and-registration.htm

Energy consumption private dwellings
http://statline.cbs.nl/StatWeb/publication/?DM=SLEN&PA=81528eng&D1=0-12&D2=0,2,13,33,74,149,327,380,447&D3=a&LA=EN&VW=T

Land use map CBS (in Dutch)
https://www.pdok.nl/en/producten/pdok-services/overzicht-urls/c