



Geographic Information Science and Technology

LandScan

A Global High Resolution Population Distribution Model

Using an innovative approach with Geographic Information Science and Remote Sensing, ORNL's LandScan is the community standard for global population distribution. At 30 arc-second resolution (approximately 1 km), LandScan is the finest resolution global population distribution data available. LandScan represents an "ambient" population (average over 24 hours) to capture the various spatial distributions of human activity throughout the course of a day in a single measure. The goal of LandScan is to develop a population distribution surface in totality, not just the locations of where people sleep (i.e. residential population). In that sense, LandScan data is analogous to mapping biological habitat where the species total environment (e.g. nests, feeding areas, travel pathways, density gradients and boundary conditions) are considered.

The LandScan algorithm, an R&D 100 Award Winner, uses spatial data, high-resolution imagery exploitation, and a multi-variable dasymetric modeling approach to disaggregate census counts within administrative boundaries. Since no single population distribution model can account for the differences in spatial data availability, quality, scale, and accuracy, as well as the differences in cultural settlement practices, LandScan population distribution models are tailored to match the data conditions and geographical nature of each individual country and region.

LandScan Characteristics:

- High resolution population distribution in a raster format
- Represents an ambient (24 hr. average) population distribution
- More realistic population distribution accounting for diurnal activities
- Subnational demographic attributes
- Upgraded annually

Applications:

- Rapid consequence and risk assessment
- Humanitarian relief
- Emergency planning, management, and response
- Environmental assessments

Annual Improvements:

- Exploit new spatial data and imagery
- New census information, mid-year population estimates, and demographic characteristics
- Integration of novel computer vision and machine learning algorithms
- Account for population distribution and movement in highly dynamic environments, including ongoing conflict areas.

For more information about LandScan, including methodology, use cases, and availability, please visit <http://www.ornl.gov/sci/landscan/>.

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