



LandScan of Italy



Oak Ridge, TN

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Oak Ridge's Population Mapping Tool Sets the Standard

When tsunamis struck the Indonesian coast in December 2004, the destruction left relief agencies scrambling to locate thousands of stranded people in need of assistance. LandScan, a global population database developed by the Department of Energy's Oak Ridge National Laboratory (ORNL), was a critical part of the response. Relief workers used LandScan population distribution maps to quickly determine the locations and numbers of potential tsunami victims who would otherwise have been cut off from communication.

Formerly known as the LandScan High Resolution Global Population Dataset, the dataset was created in the late 1990s, and has since become the gold standard in population mapping tools for public safety, sustainable development, environmental protection, disaster response and humanitarian relief. In 2011, a commercial partner was granted an exclusive license to distribute the product.

LandScan determines the population of every square kilometer in the world over a 24-hour period—the finest resolution available. The technology uses innovative algorithms to determine population based on satellite images of buildings, roads, and other man-made structures. Other sources include local census data, geographical information such as the slope of the land—which can indicate suitability for housing—as well as the intensity of surrounding agriculture.

Population data from LandScan can be overlaid on maps or images so users can quickly visualize where there are large numbers of people, according to Eddie Bright, LandScan project leader at ORNL.

Although LandScan was initially developed for military purposes, researchers at ORNL have encouraged its wider use. After Rand McNally asked to use LandScan information in its maps, "we investigated how to do that," said Bright. Map publishers, as well as The New York Times, bought the earliest commercial versions of the product. Since 2004, the LandScan dataset has been commercially licensed and distributed through CDs.

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Over the years, LandScan has been used in a wide variety of applications, from helping to determine where to locate nuclear power plants, to anticipating population demands on resources such as water and energy, to analyzing the effects of global climate change. In 2006, LandScan won an R&D 100 Award from R&D Magazine.

Users include educational, humanitarian, research, and corporate organizations, as well as government officials. In the wake of Hurricane Katrina in 2005, for example, LandScan-produced images were used to brief President Bush about the coast's affected population.

LandScan of the Caribbean



Information from LandScan can be particularly valuable in natural disasters, Bright said. "With an earthquake, tsunami or flood, for example, you can tell in a second how many people are affected. You don't have to look up atlases for every little town."

In 2011, East View Cartographic of Minneapolis was granted an exclusive commercial copyright license for LandScan. At the time, ORNL Director Thom Mason said that LandScan has become one of the lab's most successfully licensed products. "This agreement with East View Cartographic will help put this valuable population dataset into the hands of more users," he said.

East View Cartographic is a leading provider of authoritative worldwide maps, geospatial data, and geographic information

system (GIS) production services. Company founder and CEO Kent D. Lee said that "in addition to being a powerful database for environmental and humanitarian applications, we have seen strong demand from telecom, insurance and avionics customers from around the world." East View, he said, "has already split the LandScan data into regional and country-specific packages and now, as the exclusive distributor, we intend to load the content and offer affordable annual subscriptions."

The LandScan team at ORNL continues to make annual improvements to the population distribution information, using new spatial data, imagery, census information and algorithm improvements.