

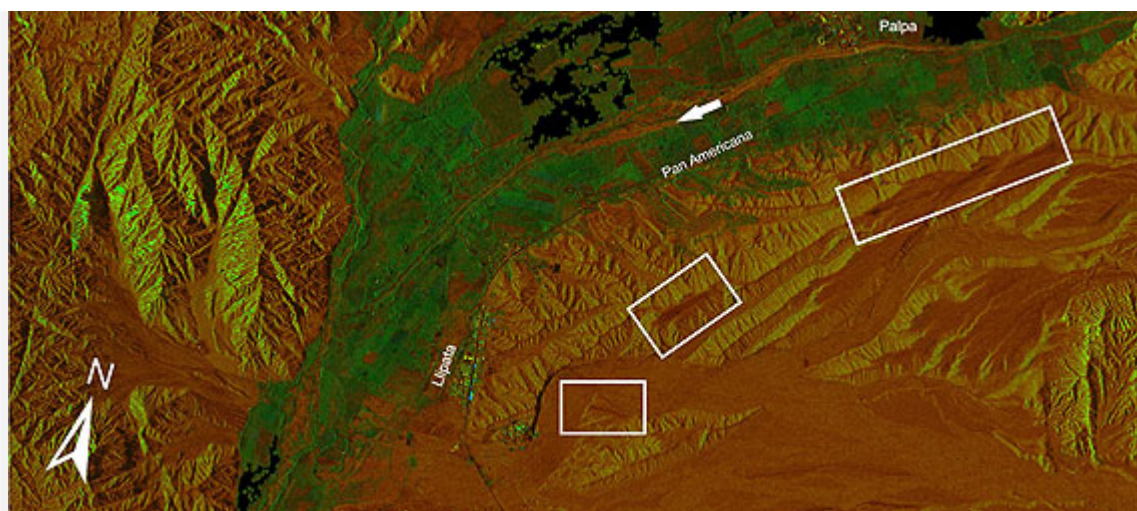
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TerraSAR-X image of the month: the Nazca lines in Peru

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by *Manuela Braun*

From the ground, the famous Nazca lines in Peru don't look like much. It is only when you look at them from a height that the mysterious drawings on the stony desert floor come to life. The German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR), TerraSAR-X radar satellite has seen them from space, providing a new view of this 2000-year-old World Heritage Site.



Nazca lines in Peru, TerraSAR-X, TSX



Drawings on the desert floor

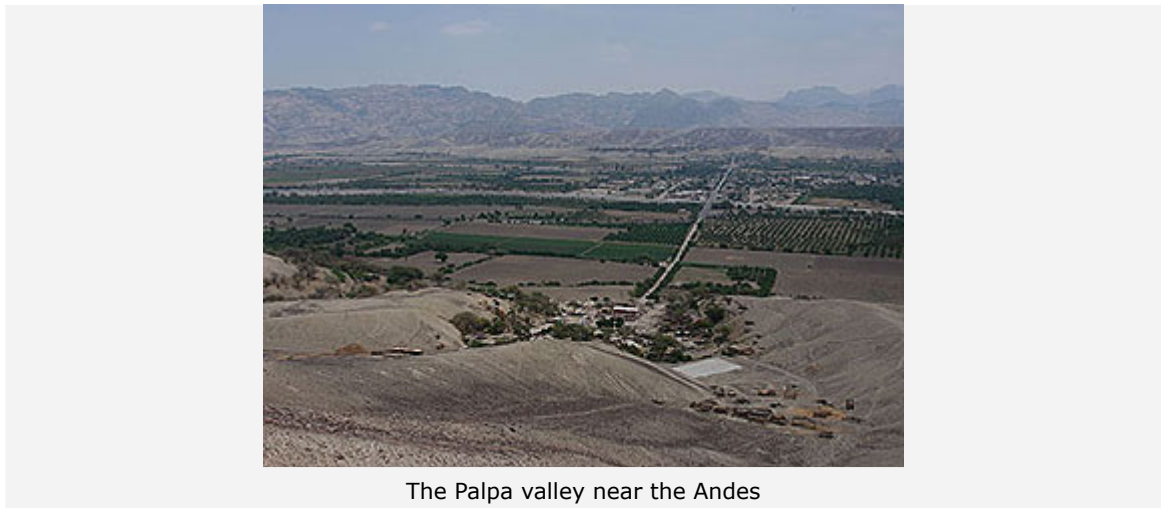
The geoglyphs show up as dark grooves in the ground in the vicinity of the small town of Palpa – which can be seen as a set of lighter dots in the picture. They can be seen on the radar images as a dark cross. The desert surface in this area normally consists of loose, rough stony ground, but in some areas this stony cover, coated with a black 'desert lacquer', is missing. In such areas we can see the lighter, finer under-surface. The stone heaps can be seen as a low wall at the edges of the clearings. The

picture also clearly shows the town of Lipata to the south, as well as the Pan Americana highway, running as a narrow black line through green fields and the reddish stony desert. The dry bed of the Rio Viscas, through which water flows for only four to six weeks a year, runs almost parallel to the highway.

World Heritage Site

It is not known why the Nazcas created these geoglyphs. It is most likely that these areas were used by the Nazcas as ritual grounds," says Dr Jussi Baade, Professor of Physical Geography at the Friedrich Schiller University, Jena (Friedrich-Schiller-Universität Jena). How these grounds may have looked back then is being debated. The lines have many different forms: those in the Palpa valley are mostly geometrical, like the lines in the picture, while those in the Pampa de Nazca, 15 to 20 km to the South, depict a man, an ape and a hummingbird. UNESCO designated the Nazca geoglyphs a World Heritage Site in 1994, declaring the desert glyphs a unique testimony to a long lost culture and a masterpiece of human creativity.

TerraSAR-X shows changes in the landscape



The Palpa valley near the Andes

The TerraSAR-X image of the Palpa valley is composed of two images taken with an interval of 11 days in October 2008. "You can clearly see that the surface of the land has changed during the period", says geomorphologist Baade. Areas that have changed the most are coloured dark green – these are mostly cultivated fields or areas with vegetation. Red areas have not changed during the time between the two pictures. The glyphs are especially unchanged, since the Peruvian desert is extremely dry. "On average, the region only experiences 10 mm precipitation every year." Erosion due to flowing water is thus almost unheard of. For scientists, the Nazca glyphs are of value primarily as a reference surface: "It helps us determine the effect on the surface roughness with radar very precisely." The scientists use TerraSAR-X to investigate how the dry valleys change from year to year, and how this is related to climate events such as El Nino. "For a geomorphologist like me, the radar images from TerraSAR-X are absolutely fascinating."

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