

URBAN LANDSCAPES: TEMPORAL CHANGES AROUND THE HISTORICAL CAPITAL OF NICOSIA

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Historic center of Nicosia is characterized by quite conserved fortifications known as Venetian walls. In 1567, due to a threat from the Ottoman empire, Venetian authority that was ruling the island of Cyprus at the time, has decided to fortify the city. The shape of a star with eleven bastions is still visible in Nicosia's urban fabric today. This poster illustrates a methodology using multi-source multi-spectral satellite imagery to observe the most recent modifications of the urban landscape around Nicosia's historic center. Freely accessible Landsat satellite data was used in three pairs of images regarding years 1987, 2003 and 2016. The changes that have occurred over the last 30 years were highlighted using a Principal Component Analysis (PCA). For a significant qualitative gradient of changes, a parameter of 5 elements was used, with 1 referring to the most and 5 referring to least significant change. Such images appear in false-colour meaning that RGB channels are attributed to single elements of the PCA. Hence, the colours seen on the image do not have an absolute value but are an indication of change in the cover of the land. A closer look on the walled city of Nicosia and its southern area within the PCA image 1987-2016 show significant changes around the city walls, just out of the walls and along the main transport arteries of the city (red colour). However, such observations require further qualitative and quantitative interpretation. Areas assumed as "hot-spots" need to be further assessed using ground-truth data, city masterplans and technical maps. It should be noticed though that observations of different types and densities of urban development could be a very valuable contribution to the planning zone maps of possible future urban development, in particular in proximities of historic centers.

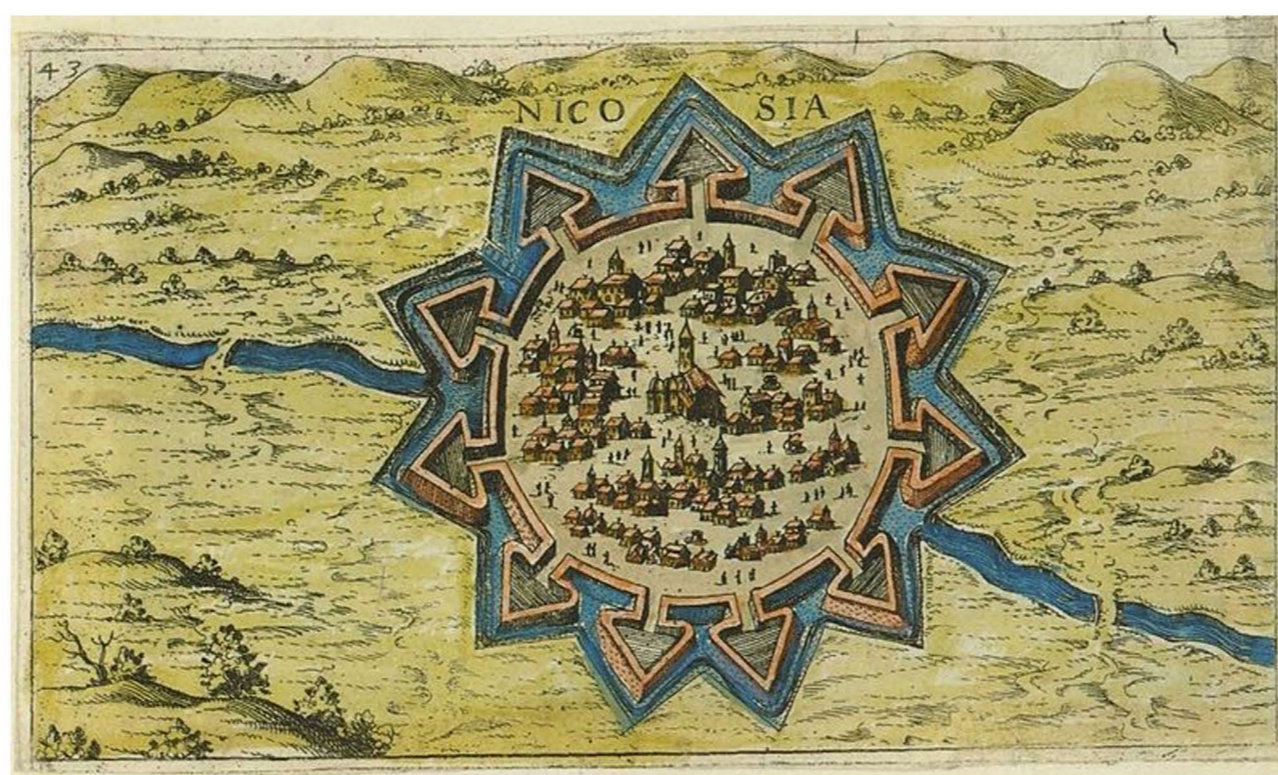


Fig 2. Walled city of Nicosia by Giacomo Franco, 1597 (source: Wikipedia)

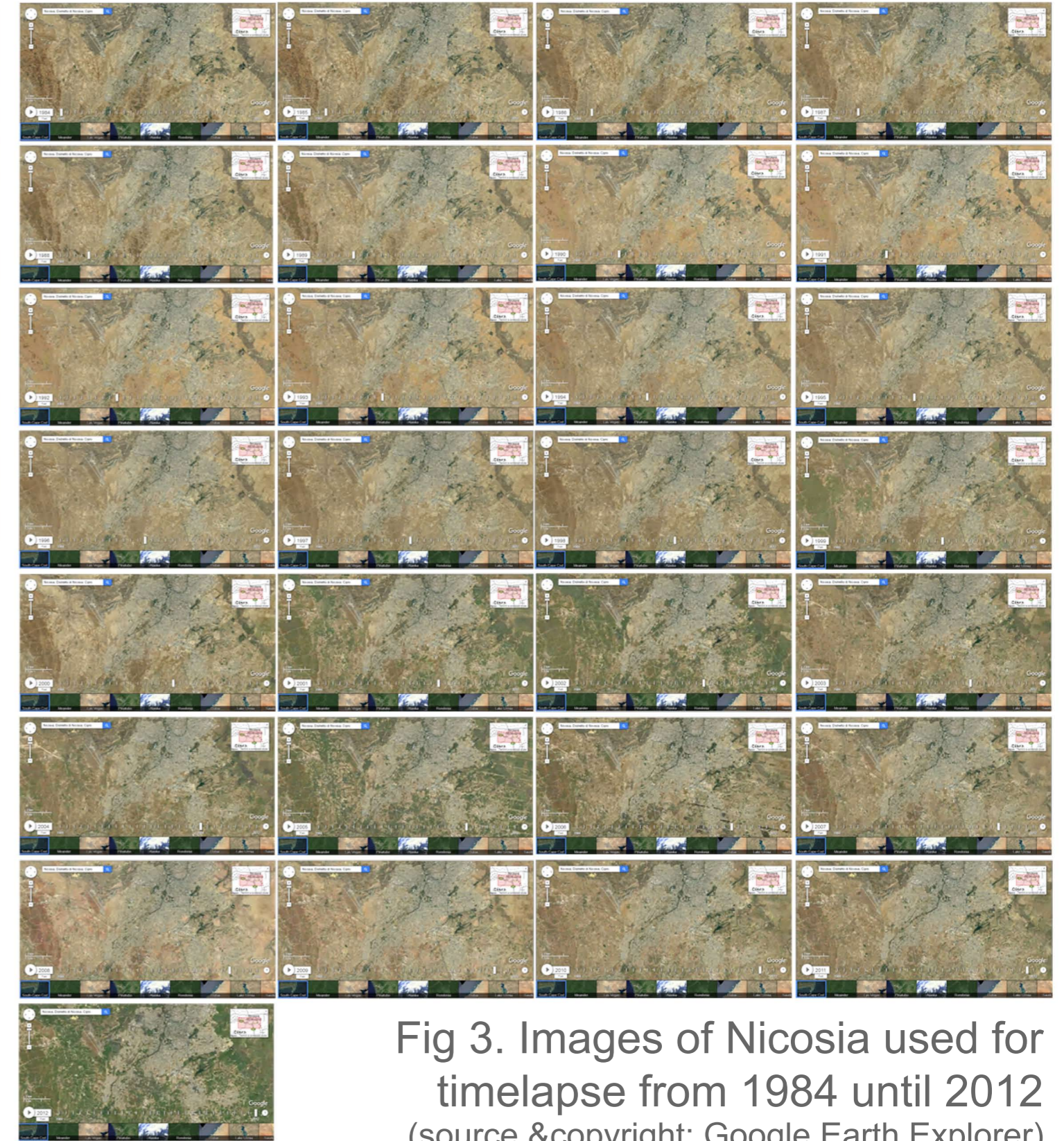


Fig 3. Images of Nicosia used for timelapse from 1984 until 2012 (source & copyright: Google Earth Explorer)

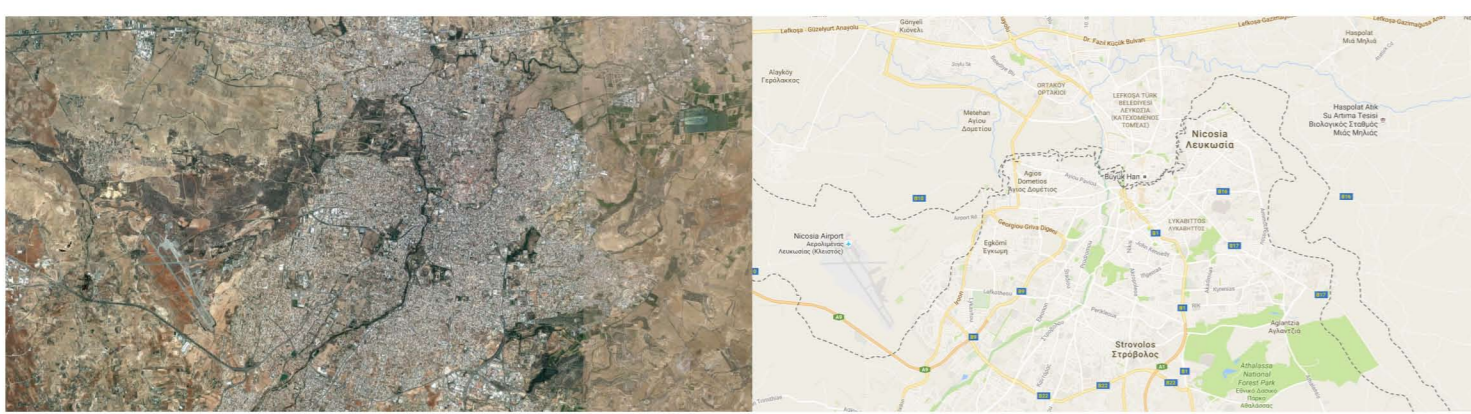


Fig. 1: Nicosia municipality, as seen from space (low left) and within Google maps (low right).

Venetian walls: Julio Savorgnano, an architect and engineer has designed new fortifications for the city according to contemporary defence methods in the shape of a star with eleven bastions. This feature is still visible in the urban fabric of Nicosia today.

METHOD APPLIED FOR MULTI-TEMPORAL MULTI-SPECTRAL IMAGE ANALYSIS

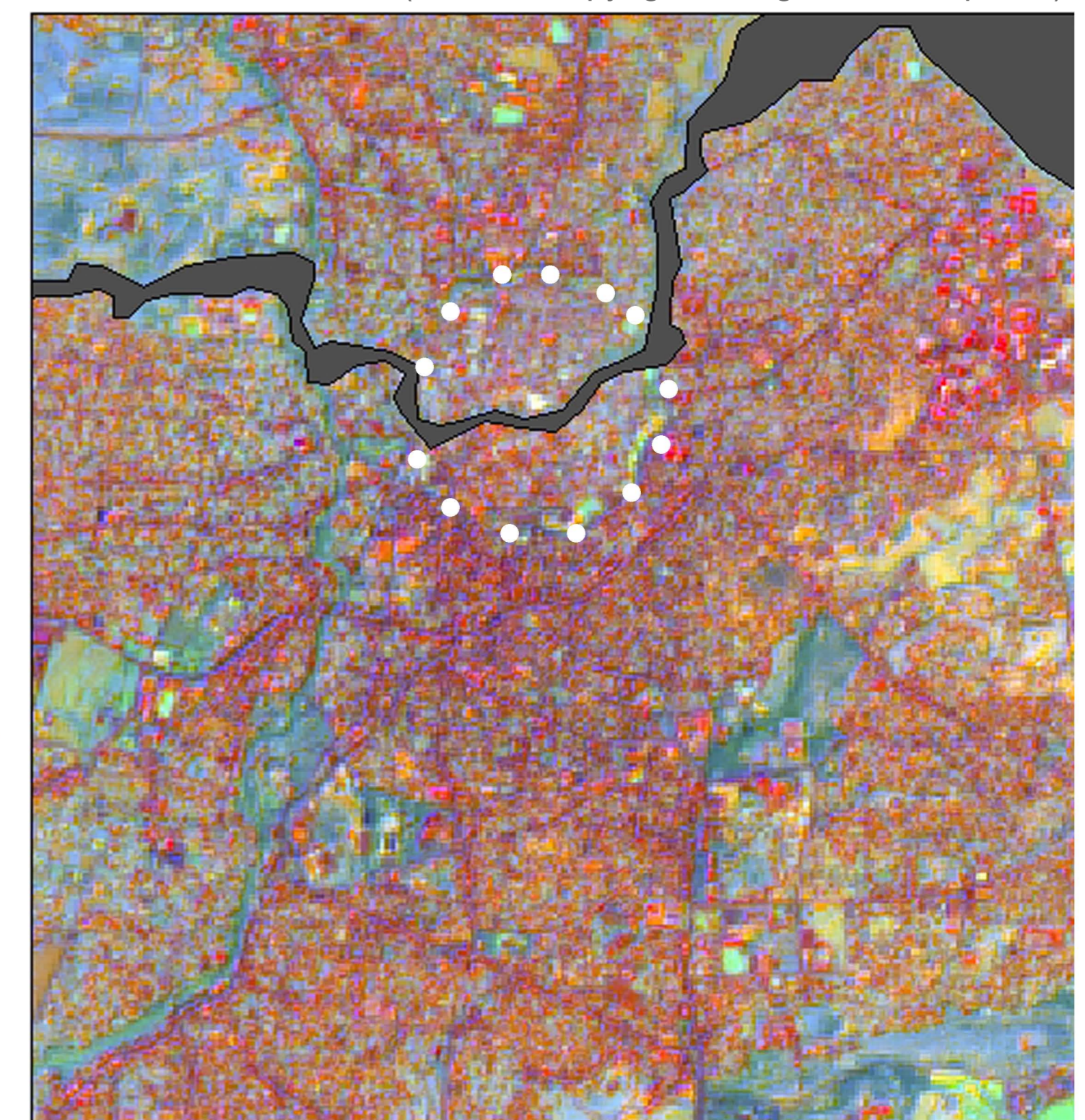
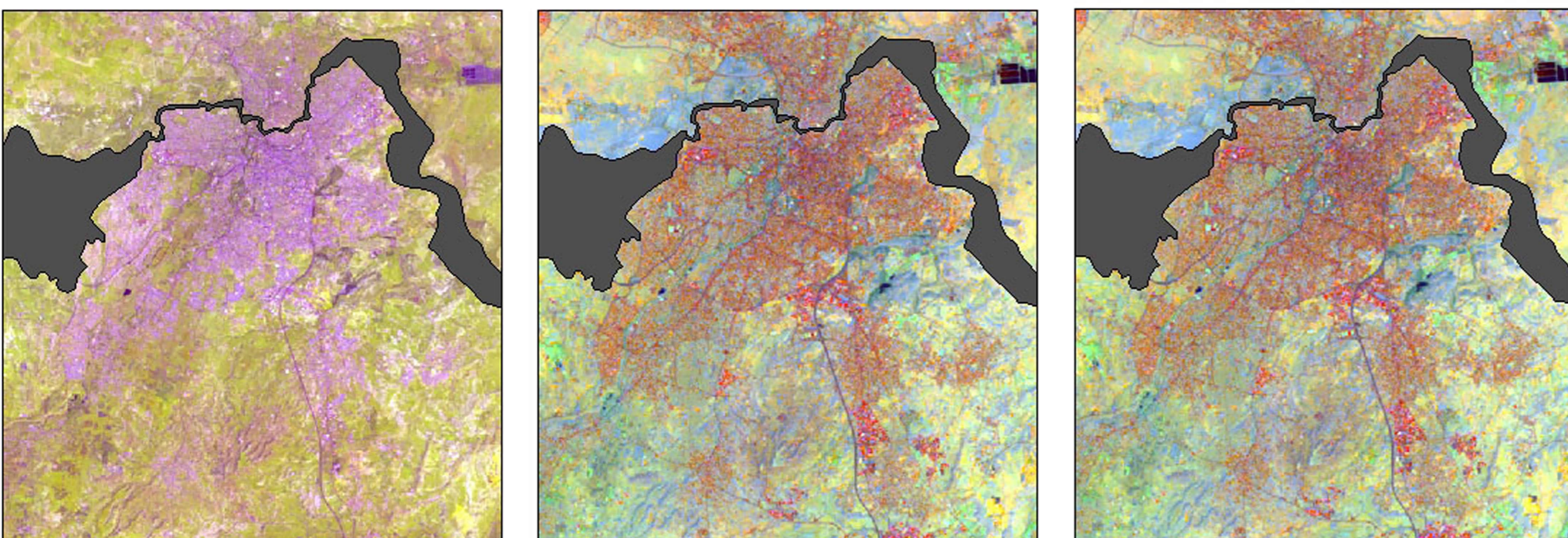
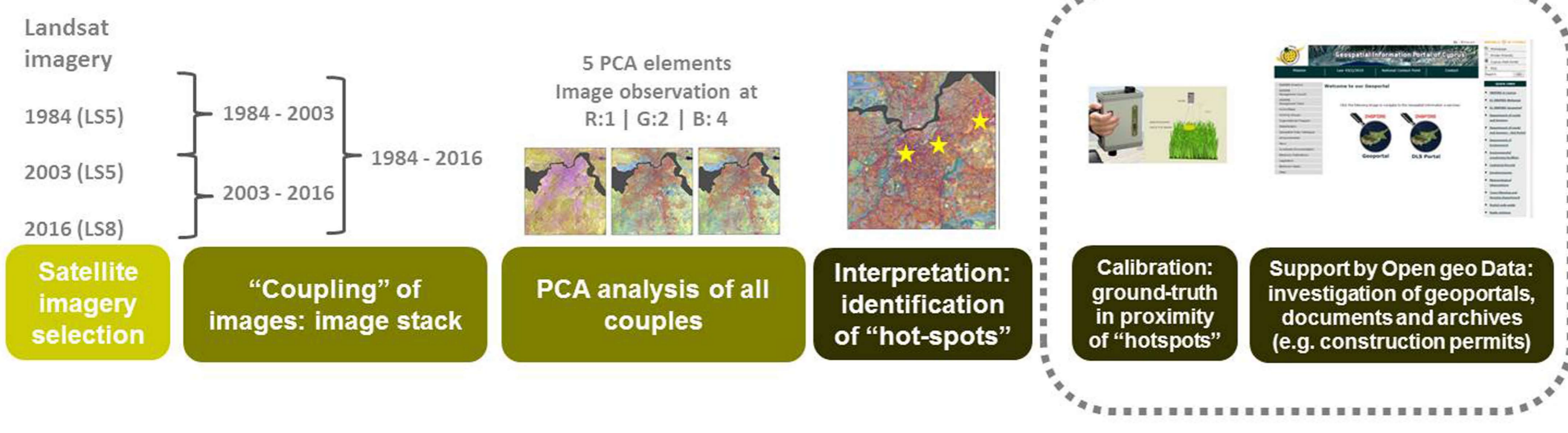


Fig. 4 Principal Component Analysis for image pairs: 1987-2003 (left); 2003-2016 (middle) and 1987-2016 (right). Buffer zone is shown as hatched area.

Fig. 5 PCA of the image pair 1987-2016, a close-up on southern Nicosia.

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