In autumn, the peaks of the Swiss National Park are already covered in snow, while golden-coloured larches provide a contrast to evergreen pine and spruce trees.

Swiss National Park   SWITZERLAND

For centuries, mountain ecosystems in the Alps have provided essential services such as food, timber and protection from natural hazards (e.g. avalanches, landslides), enabling mountain societies to thrive in these marginal environments. They also offer many opportunities for recreation, provide habitats to many rare and charismatic species, and contribute to climate regulation.

As social and economic conditions in mountain regions change, so does the use of the land. Abandonment of traditional agriculture favours the transition from pastures to forests. In the absence of grazing and forest management, forests become more dense, and their species composition changes. For example, open larch forests may transition to denser spruce stands, increasing their effect in preventing and protecting against avalanches, but perhaps reducing their aesthetic value.

The Swiss National Park was established in 1914 as the first national park in the Alps, with the aim of minimizing human disturbance and letting natural processes take their course. Since no human interventions are allowed, it offers a perfect opportunity to observe the transition from a managed landscape to wilderness, and to monitor the effects of climate change. Comparing it to areas across the Swiss Alps that are managed for agriculture and tourism enables the effects of human interventions to be better understood.

Traditionally, the monitoring of changes in mountain ecosystems required taking ground measurements. In contrast, the ECOPOTENTIAL project is now using Earth Observation to provide timely information covering the whole area of the park and to better understand where ecosystem services take place. For example, a combination of airborne and satellite imagery is used to distinguish different forest structures and tree species. This information is used to develop a model that allows the mapping of the forests that are most important in preventing the formation of avalanches.

Hikers walk along the lakes of Macun.

This image is a canopy height vegetation model of the Swiss National Park. It helps to distinguish different forest structures. Original data from Swisstopo.

Produced by CESBIO for ECOPOTENTIAL.
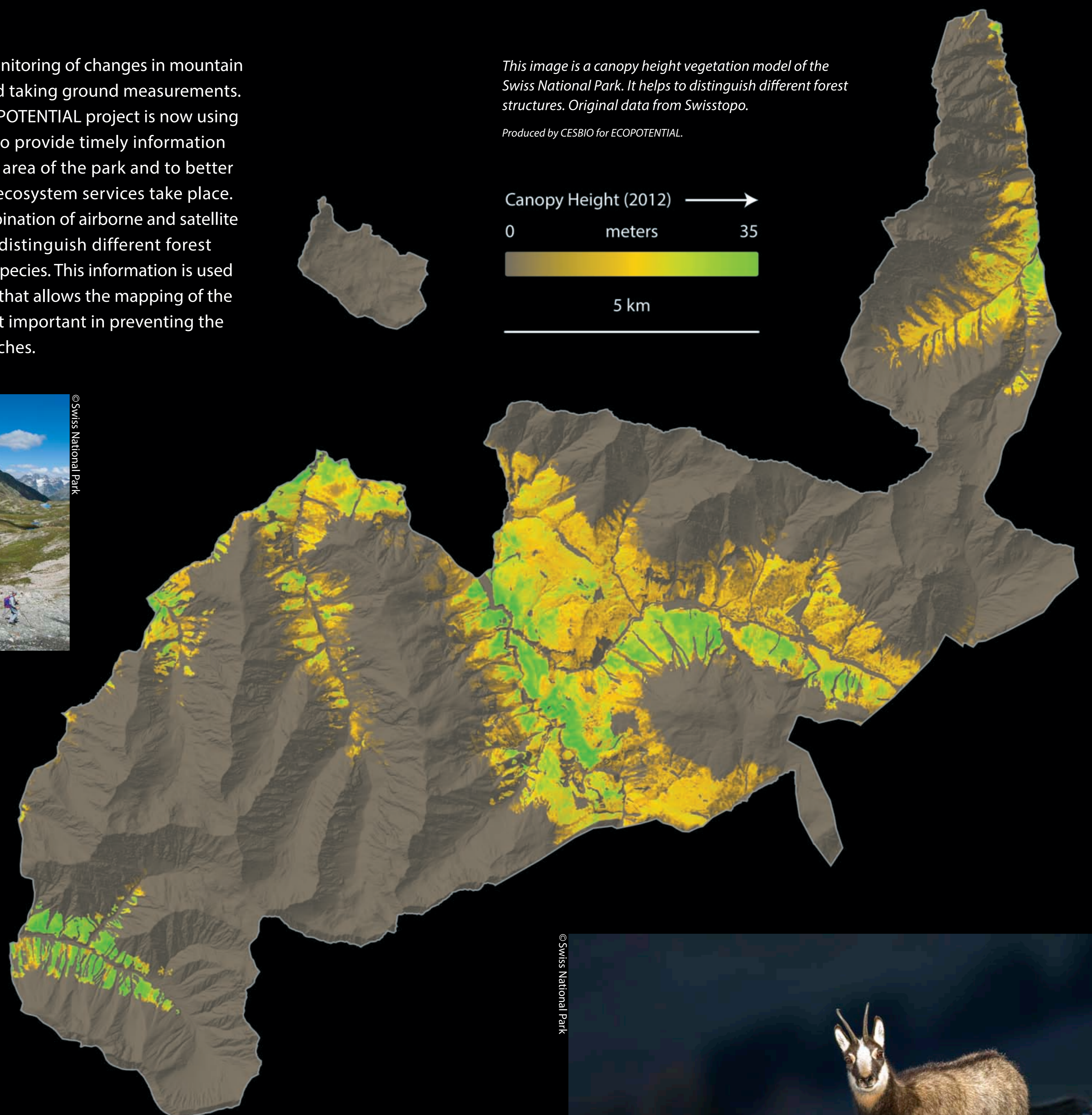
Canopy Height (2012)

0   meters   35

5 km

The sun breaks through the clouds over an alpine meadow.

A survey of mountain flora at the summit of Munt Buffalora.

Ungulates such as the chamois (Rupicapra rupicapra, pictured here), Alpine ibex (Capra ibex) and red deer (Cervus elaphus) occur in high densities in the Swiss National Park, where they are undisturbed by hunting or other human activities.