



**SoilSkin - La Piel Viva del Suelo:  
Un programa de ciencia ciudadana para  
evaluar la vulnerabilidad de los ecosistemas  
y sus funciones frente al cambio global**



## Introduction

Soil is a crucial ecosystem that provides a large number of ecosystem services that benefit human welfare (e.g. provides food, fiber, fuel, building materials and pharmaceutical products). Additionally, it is involved in the global cycles that make life possible on Earth (e.g. carbon cycle, water cycle etc.), thus playing a crucial role in the maintenance and health of ecosystems worldwide. For example, it is involved in carbon sequestration, water purification and reduction of pollutants, flood control and climate control. All these services and functions are tied to the structural complexity and diversity of soils.

An important component of soil biodiversity are the Biological Soil Covers (BSC). BSCs are small sized communities that develop on the few upper centimeters of the soil, forming a “living skin” over it. They cover around 12% of the terrestrial surface and are usually dominated by mosses, lichens and, to a lesser extent, algal colonies. BSCs play key roles on ecosystem functioning by preventing soil erosion, regulating the water balance and nutrient cycling, and acting as bioindicators by helping scientists screen the health of ecosystems.

SoilSkin is a citizen science project lead by researchers of the *Universidad Autónoma de Madrid* (UAM) and the *Museo Nacional de Ciencias Naturales* (MNCN-CSIC), developed in collaboration with the *Fundación Española para la Ciencia y la Tecnología* (FECYT). The project aims to evaluate the vulnerability of soil ecosystems of the Iberian Peninsula in the face of global change, by making use of BSC communities as bioindicators, as well as to disseminate scientific knowledge and raise awareness about the value of these tiny organisms.

In this context, we have developed three simple educational Activities through which students have the chance to get to know what BSCs are, explore their functions and understand that the conservation of nature lies beyond the protection of just big and attractive organisms. Each Activity focuses on a different role of BSCs in ecosystem functioning, highlighting a different aspect of their significance. Each Activity can be carried out independently and you can opt to perform any of the three or all of them in any combination you prefer.

Check the outline of the Activities below!

### Activity 1 Erosion

#### ↪ Objective

Understanding the role of BSCs in the water cycle and how they mitigate soil erosion by reducing surface runoff.

#### ↪ Description

You will simulate erosion caused by rainfall under three different scenarios with increasing abundance of BSC: bare soil (without BSC), moderately-developed and well-developed BSC.

#### ↪ Duration

In the field: ~ 40 mins  
In the classroom: ~ 1 h (prep. & main experiment), 2-3 days waiting time in between

### Activity 2 eBryoSoil: Citizen Science project

#### ↪ Objective

Learning about the role of BSC communities as bioindicators for monitoring the state of soil ecosystems by participating in a citizen science project.

#### ↪ Description

You will use the mobile app eBryoSoil to collect data over the distribution, abundance and health of BSC communities.

#### ↪ Duration

In the field: ~ 1 h

### Activity 3 A Climate Change Experiment

#### ↪ Objective

Designing experiments to explore the effects of climate change on the water cycle and BSC communities.

#### ↪ Description

You will perform an experiment to explore how global warming will affect the water relationships in the soil

#### ↪ Duration

In the field: ~ 1 h  
In the laboratory: ~ 4 h

# eBryo SoilSkin

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Con la colaboración de:

