

## **Title: Incorporating species distribution modelling in genetic analyses**

Landscape genetics and genomics have emerged as powerful tools to detect barriers to gene flow, identify and evaluate migration corridors, explore population dynamics, and assess the influence of local adaptation on the spatial patterns of genetic variation. While species distribution models (SDMs) or ecological niche models (ENMs) are widely used to predict species distributions, their integration with genetic data remains underutilized.

This workshop aims to incorporate genetic data and species distribution models to examine whether including genetic variation into the SDMs can alter their predictions? We will explore how incorporating genetic variation into SDMs can refine predictions, potentially providing more accurate insights into species' distributions and evolutionary processes.

### **Goals and Objectives:**

#### **1- Introduction to Species Distribution Models (SDMs):**

- Understanding the concepts and methodologies behind SDMs.
- Learning about the types of data required for developing accurate models.

#### **2- Application of SDMs in Genetic Studies:**

- Exploring how SDMs can be integrated into genetic research.
- Examining the role of SDMs in predicting spatial patterns of genetic variation.

#### **3- Resistance Surfaces and Landscape Impacts:**

- Understanding resistance surfaces and how they assess the influence of landscape features on gene flow and genetic variation.
- Learning to evaluate the impact of landscape features on spatial genetic patterns.

#### **4- Creating Resistance Surfaces Using SDMs:**

- Developing and implementing resistance surfaces derived from SDMs.
- Using resistance layers to model the impact of landscape on genetic patterns.

#### **5- Coupling SDMs, Resistance Surfaces, and Genetic Structure Analyses:**

- Integrating SDMs with resistance surfaces and genetic data to assess the interaction between species distributions and genetic structure.