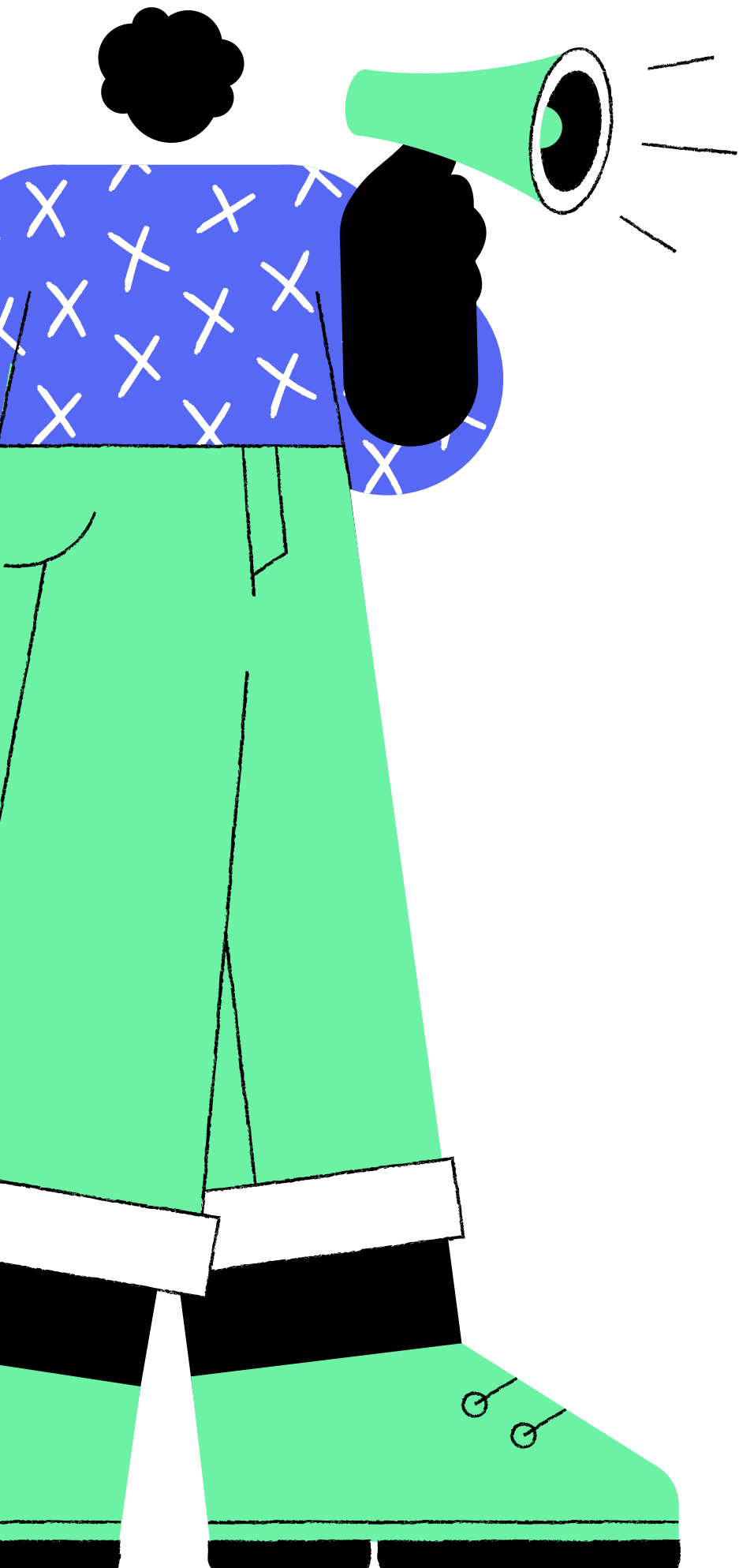Declustering in Resource Estimation

DEEPLIME

# What is Declustering in Resource Estimation?

Declustering, as a resource modelling tool, is a statistical correction of the sampling data.
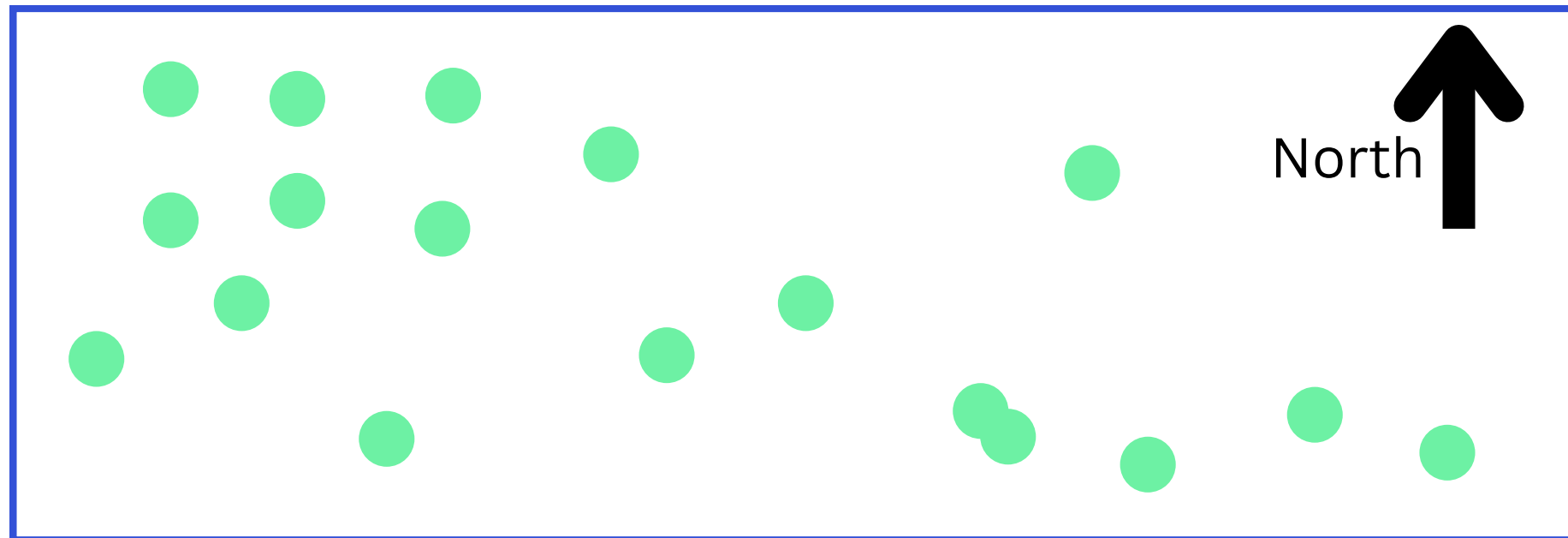
The drill holes are usually unevenly distributed, as they target the high-grade areas, leading to the raw grade statistics being biased.

**Mean, quantiles, and standard deviation can be over or under-estimated.**
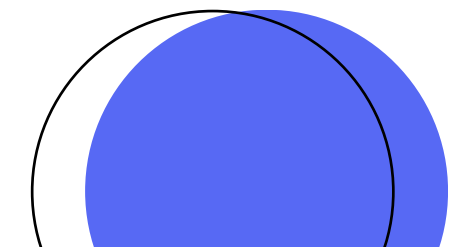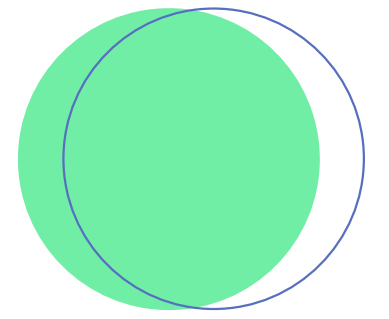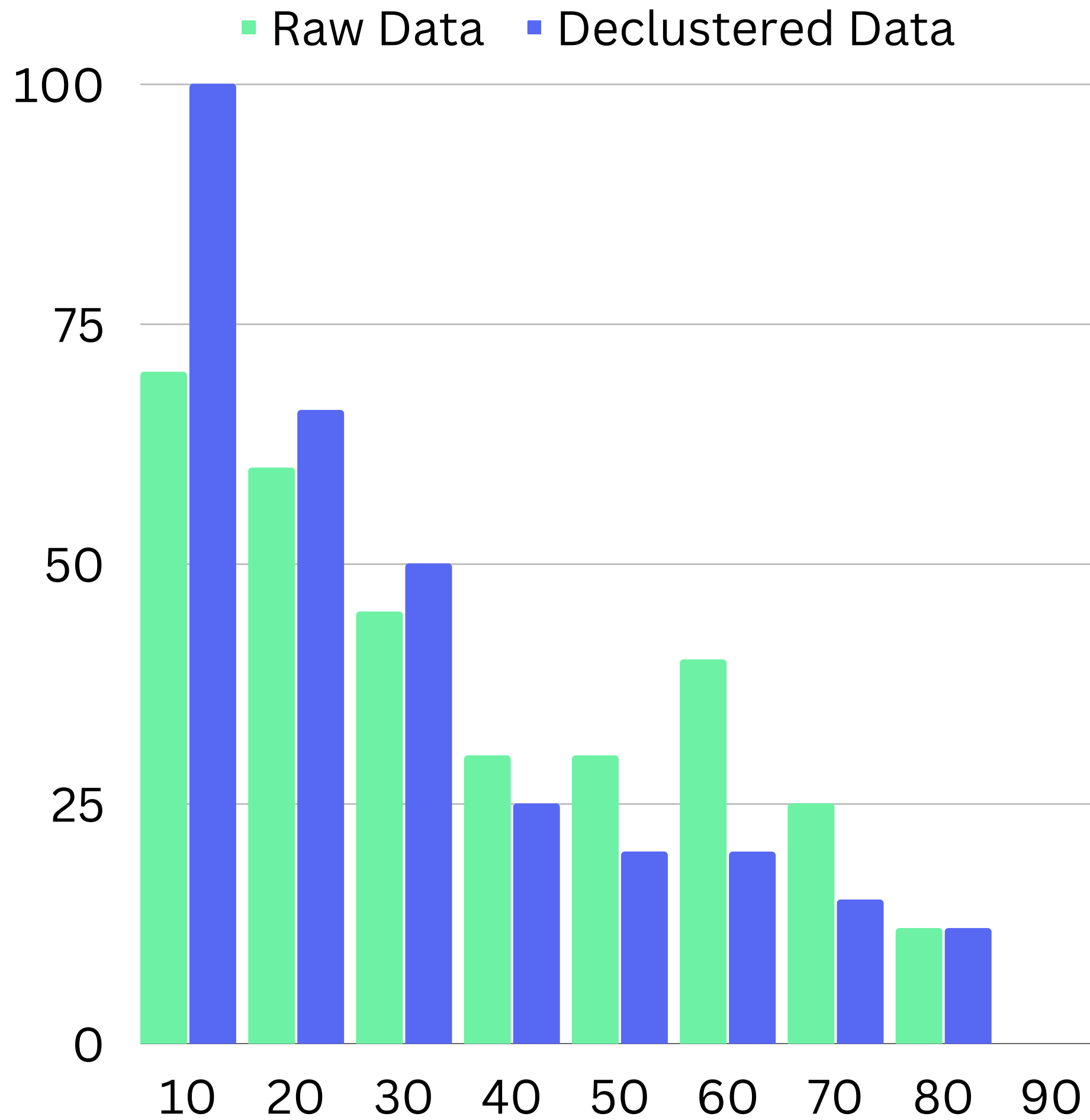
# Pseudo-regular Sampling



North

# Irregular Sampling



North
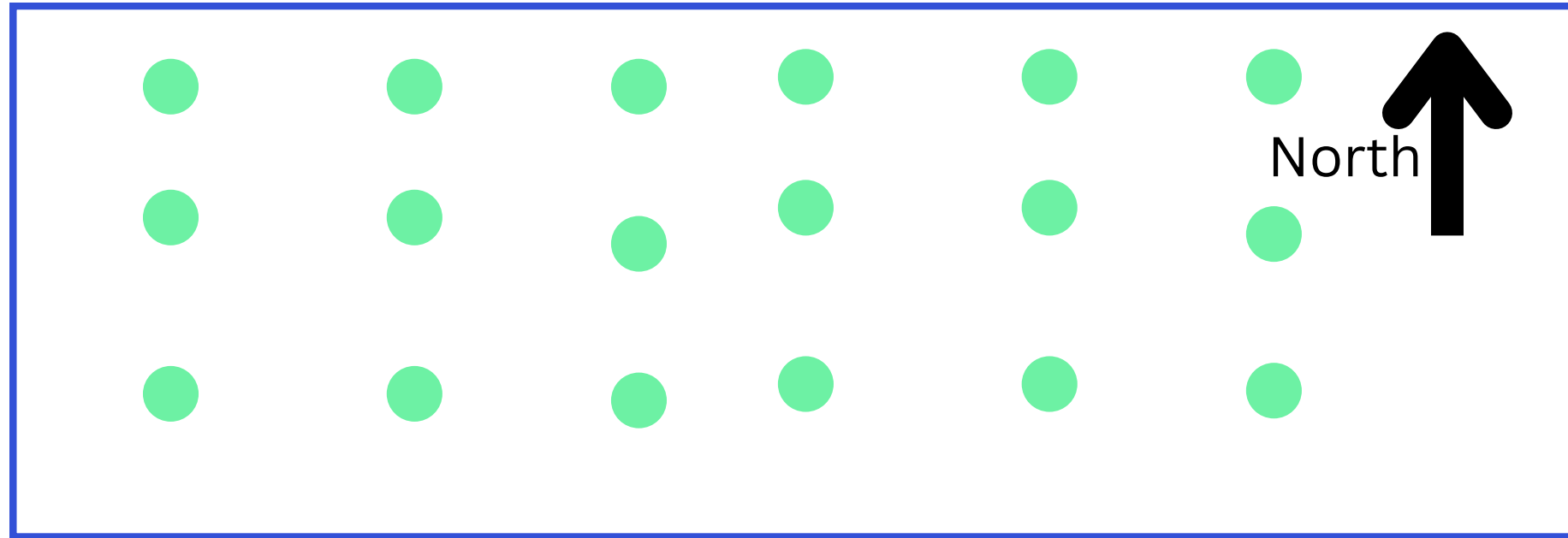
An irregular sampling biases the statistical properties of the data distribution. This is especially true if there is a trend in the data.

Declustering effect can be visualized through a histogram, by comparing the statistics with and without the declustering

# How Declustering Works

There are several declustering algorithms. They usually assign a weight to each sample to correct the data statistics: mean, standard deviation and quantiles.

# Most Used Algorithms

Most declustering studies will be using one of three methods:

- Moving window declustering
- Cell declustering
- Polygon declustering

The following slides will looked into the most commonly used method: the Moving Window Declustering.
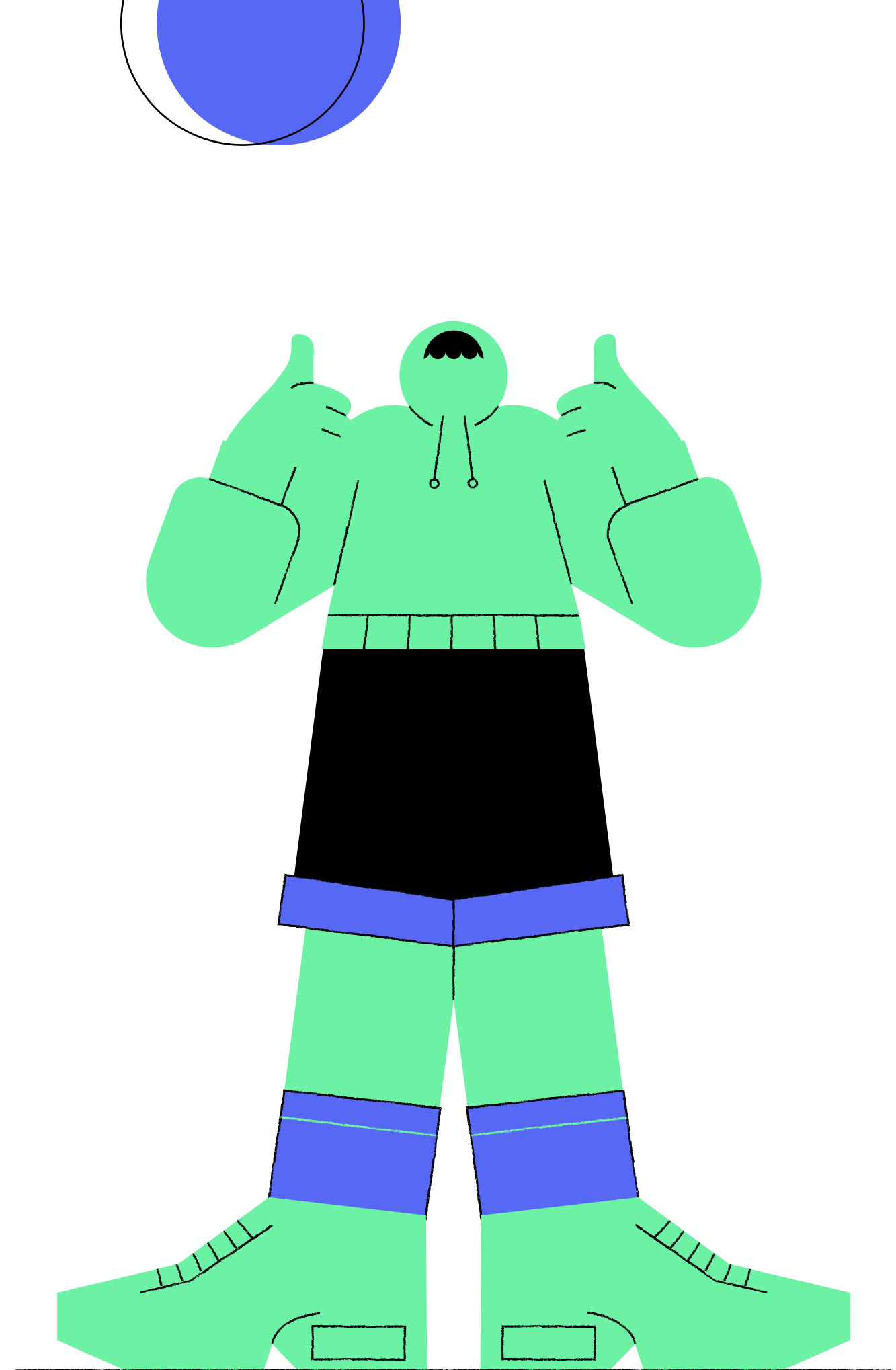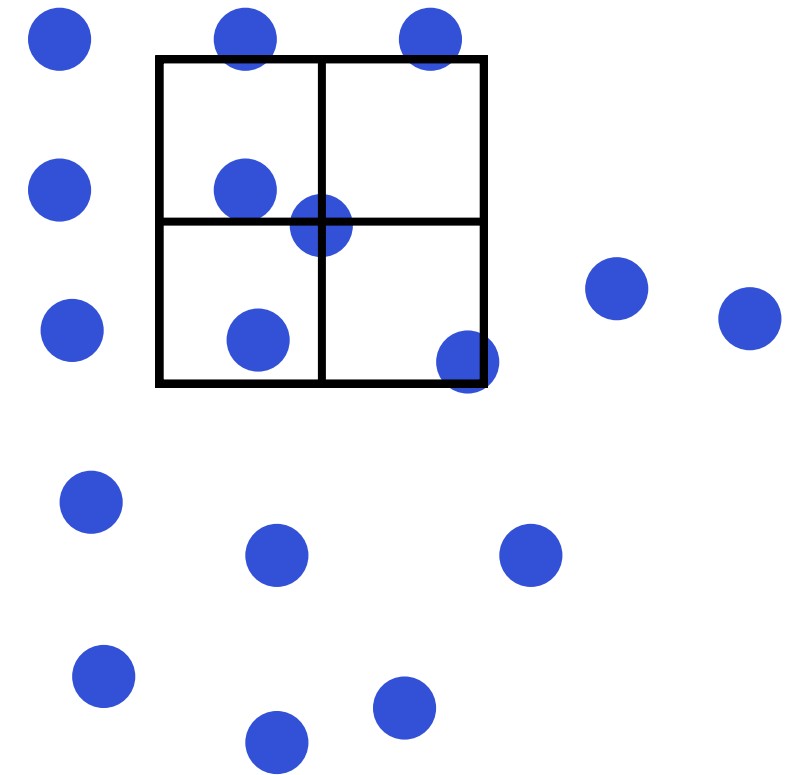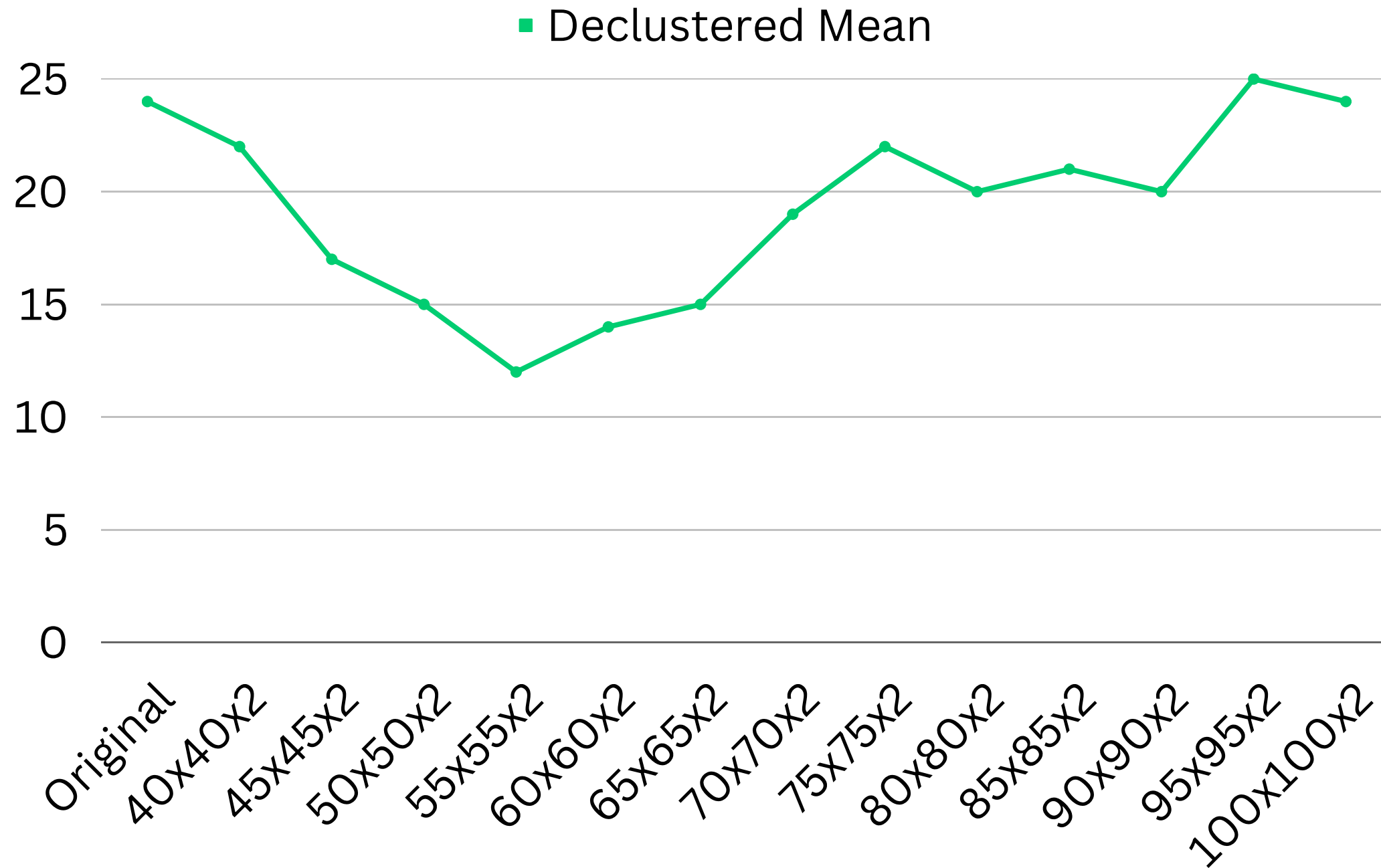
# Declustering: Moving Window Overview

- A window of a given size is centered on each sample.
- The weight of a sample is given by the mean number of neighbors divided by the number of neighbors:

$$W_i = Mean_n * \frac{1}{n_i}$$

This algorithm is sensitive to the window size defined by the user.

# Testing Window Size



Several moving window sizes can be tested to understand the bias due to irregular sampling.

The selected size should correspond to the most representative drillhole sampling mesh.

# Kriging and declustering

Kriging has a "natural declustering effect", which is a benefit. This means kriged blocks statistics will be closer to the declustered data than the raw data.

A declustering analysis can help explain a shift in statistics between the drill hole data and the estimates.
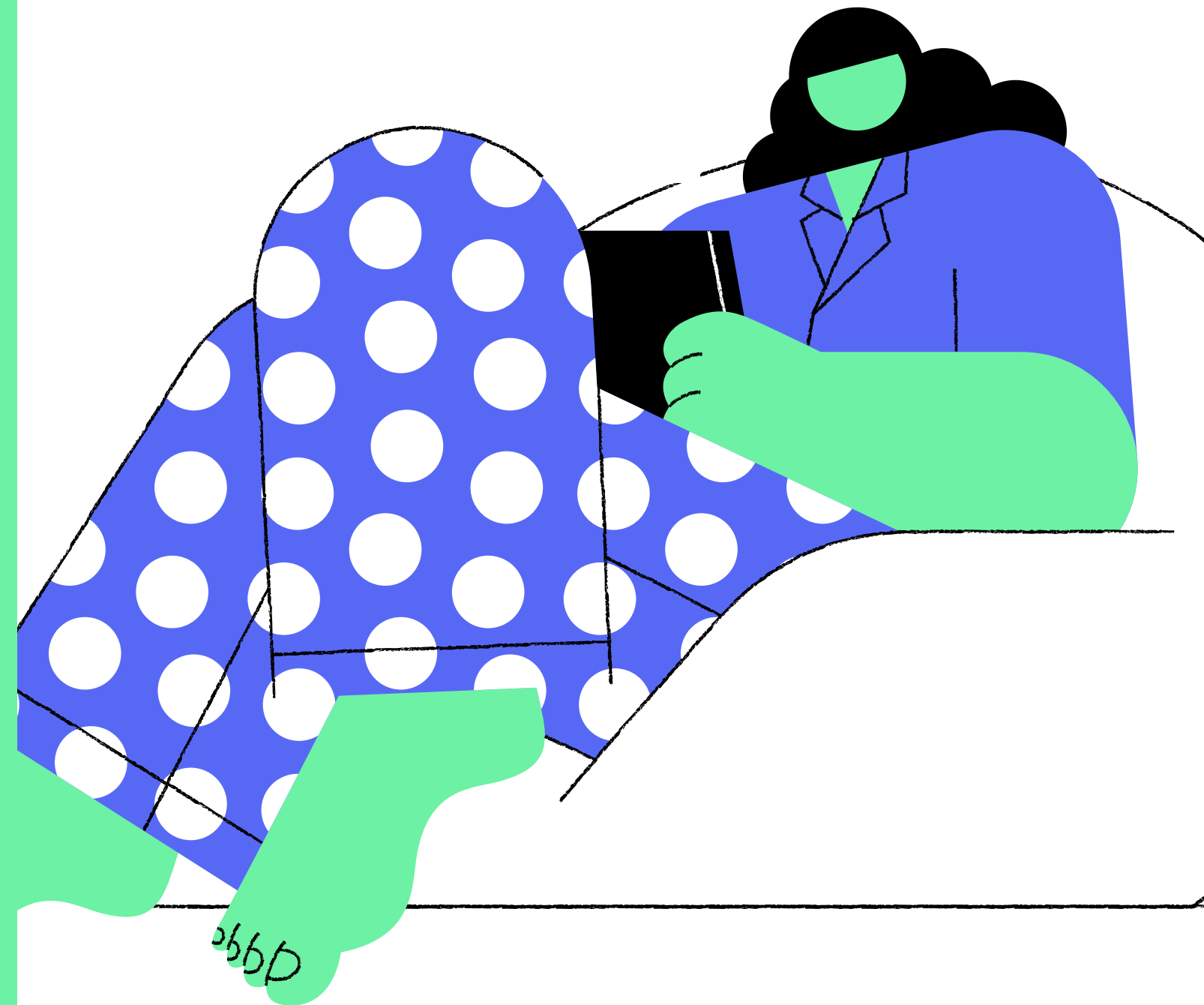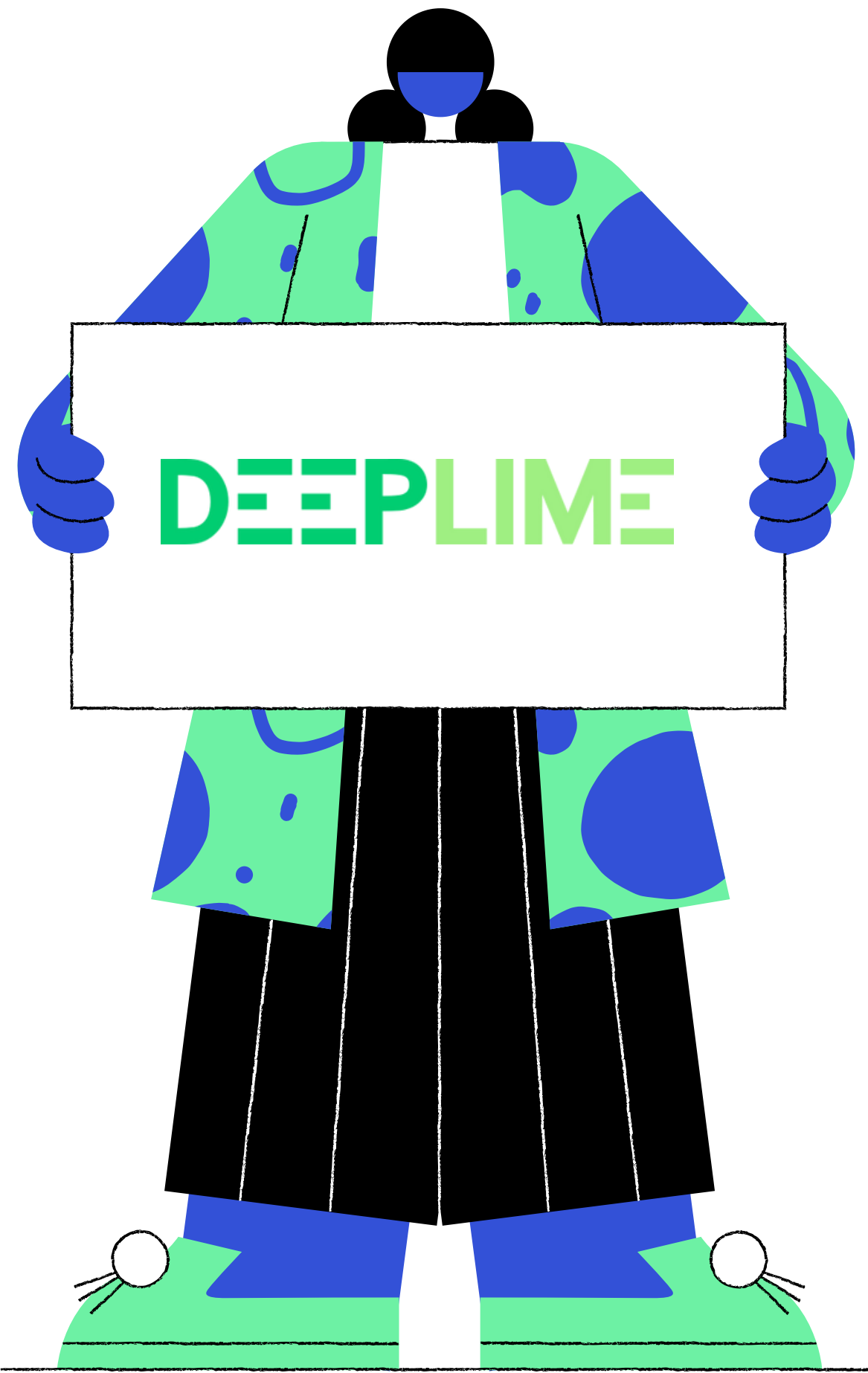
**Want to see a real case study?**

Feel free to contact us.

contact@deeplime.io