



FCT

Fundação para a Ciência e a Tecnologia
MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E ENSINO SUPERIOR

CEGOT

Centro de Estudos de Geografia
e Ordenamento do Território



SoilReCon



UNIVERSIDADE D
COIMBRA

Soil BON

● ○ • Soils
SOLO for
• ● ○ Europe

Amostragem do solo

Sistemas territoriais de monitorização do solo

Carlos A. Guerra

**Explorar
os solos
através de
múltiplos usos**



Urbano



Floresta



Espaços naturais



Agricultura



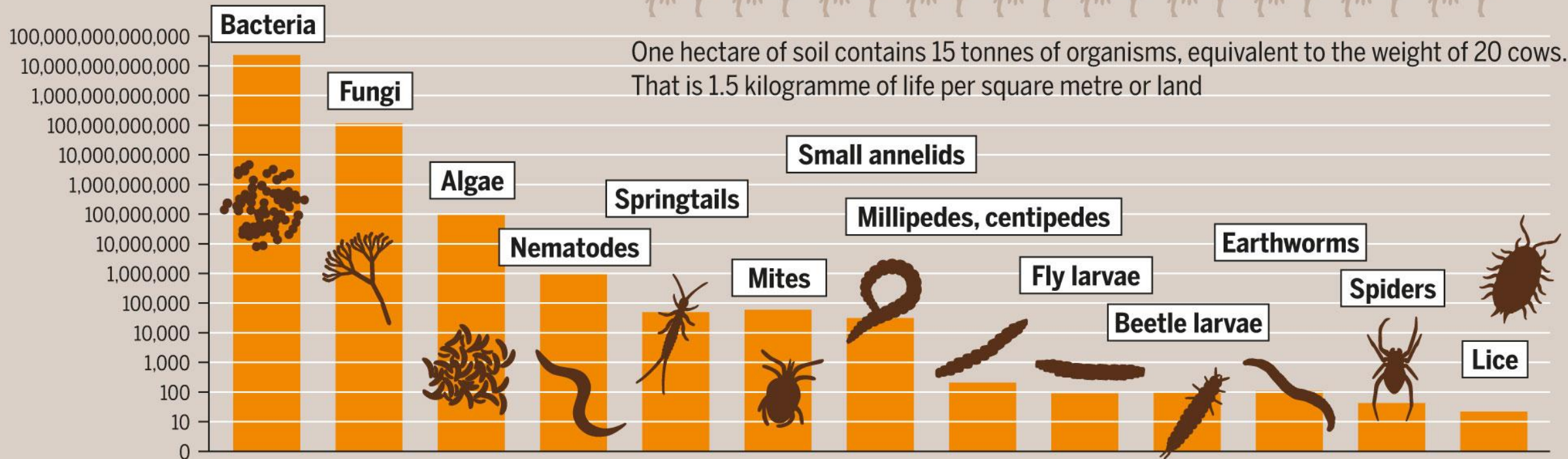
Biodiversidade do Solo

Desenterrar a biodiversidade do solo



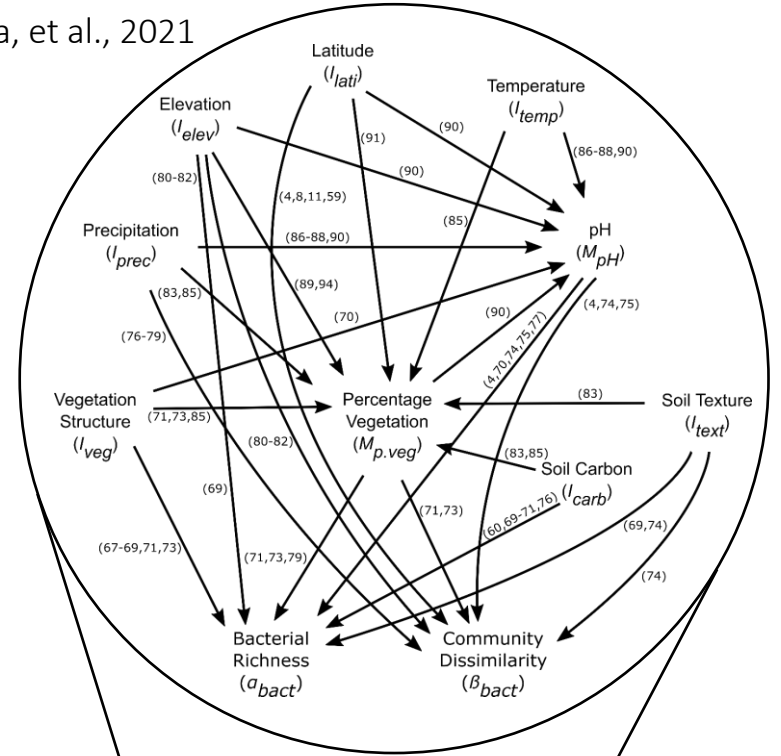
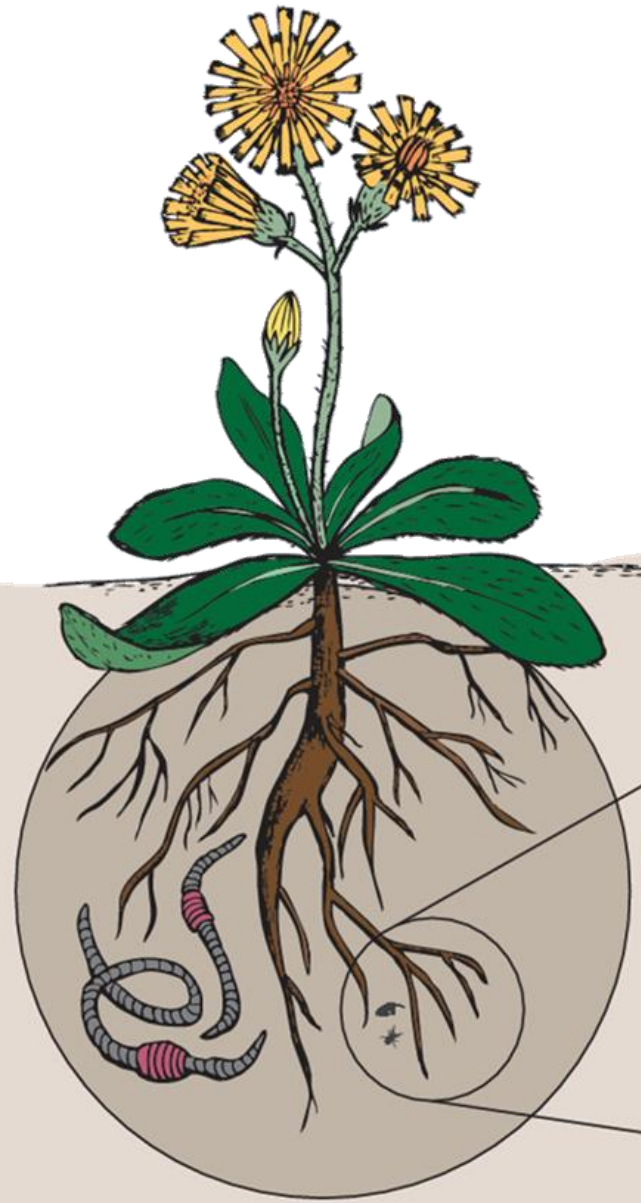
TEEMING SOILS

Number of living organisms in 1 cubic metre of topsoil in temperate climates, logarithmic scale

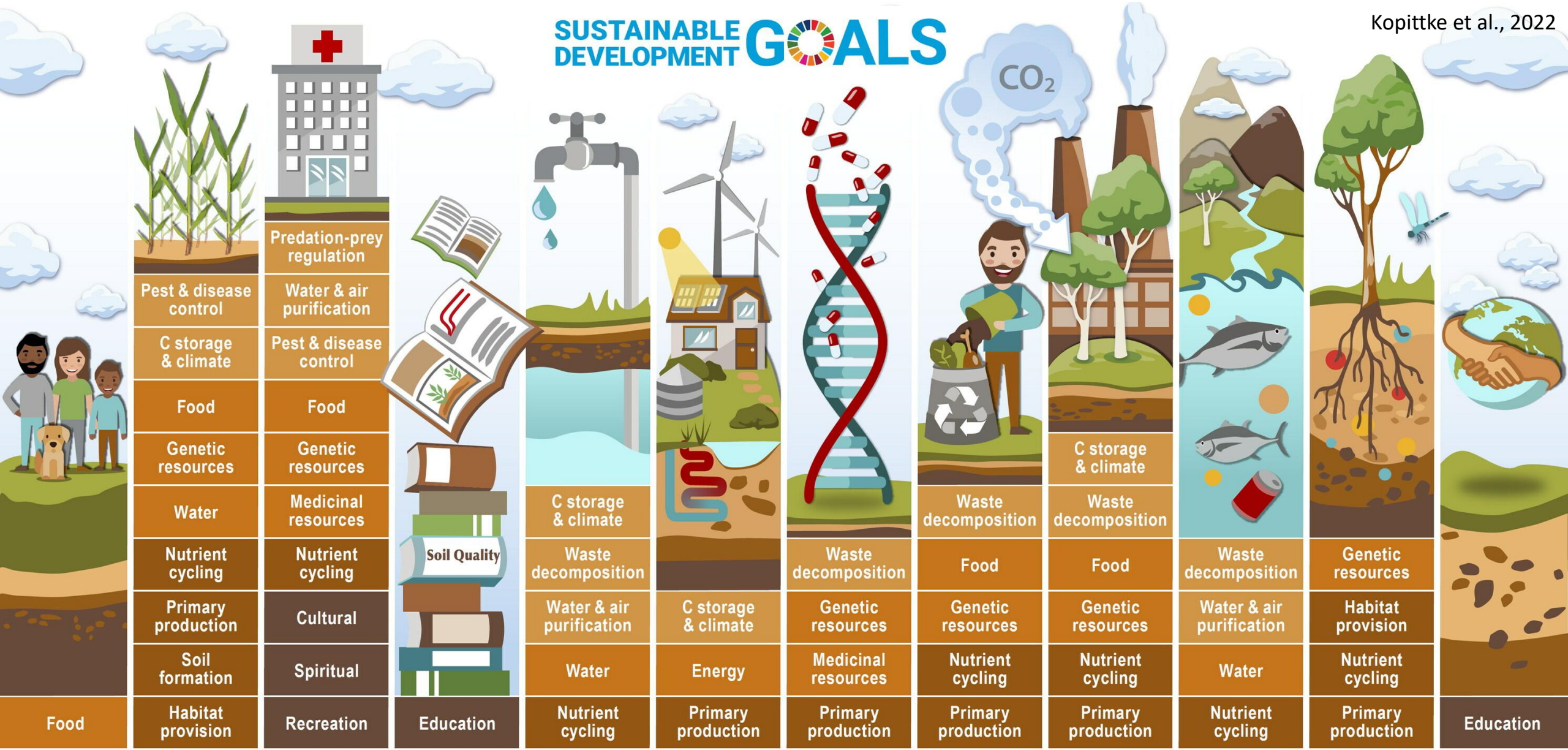


Um problema de escala

Guerra, et al., 2021



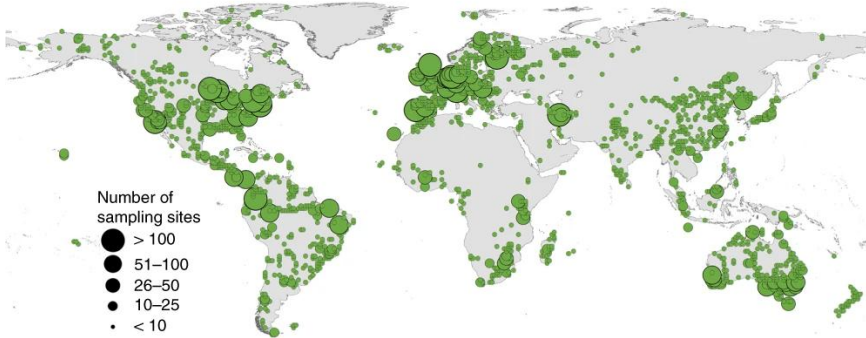
SUSTAINABLE DEVELOPMENT GOALS



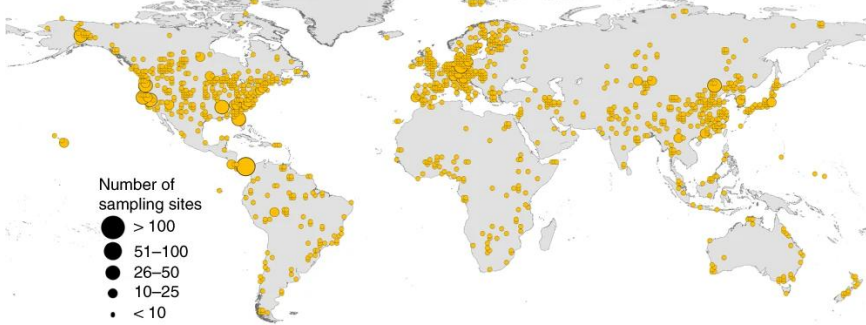
- 1 NO POVERTY**
- 2 ZERO HUNGER**
- 3 GOOD HEALTH AND WELL-BEING**
- 4 QUALITY EDUCATION**
- 6 CLEAN WATER AND SANITATION**
- 7 AFFORDABLE AND CLEAN ENERGY**
- 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE**
- 12 RESPONSIBLE CONSUMPTION AND PRODUCTION**
- 13 CLIMATE ACTION**
- 14 LIFE BELOW WATER**
- 15 LIFE ON LAND**
- 17 PARTNERSHIPS FOR THE GOALS**

Blind spots in global soil biodiversity and ecosystem function research

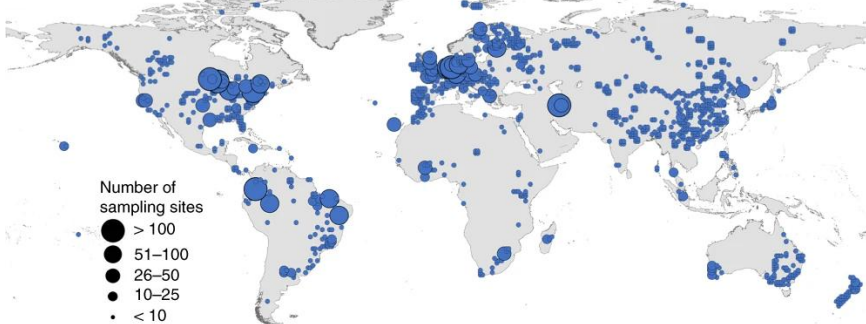
Biodiversidade



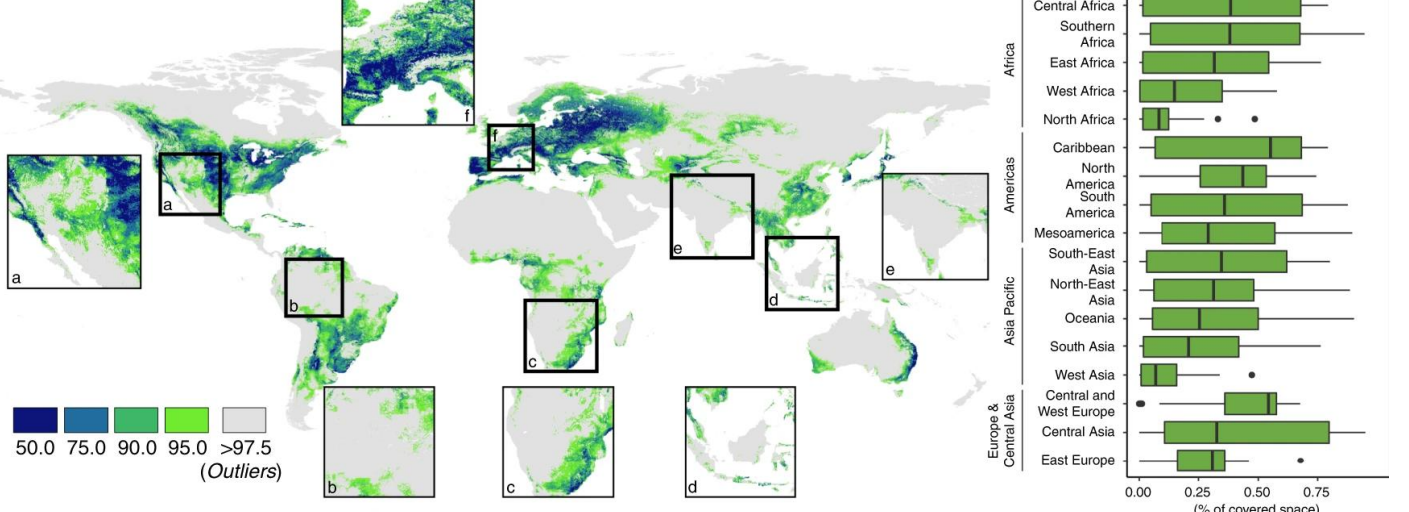
Função



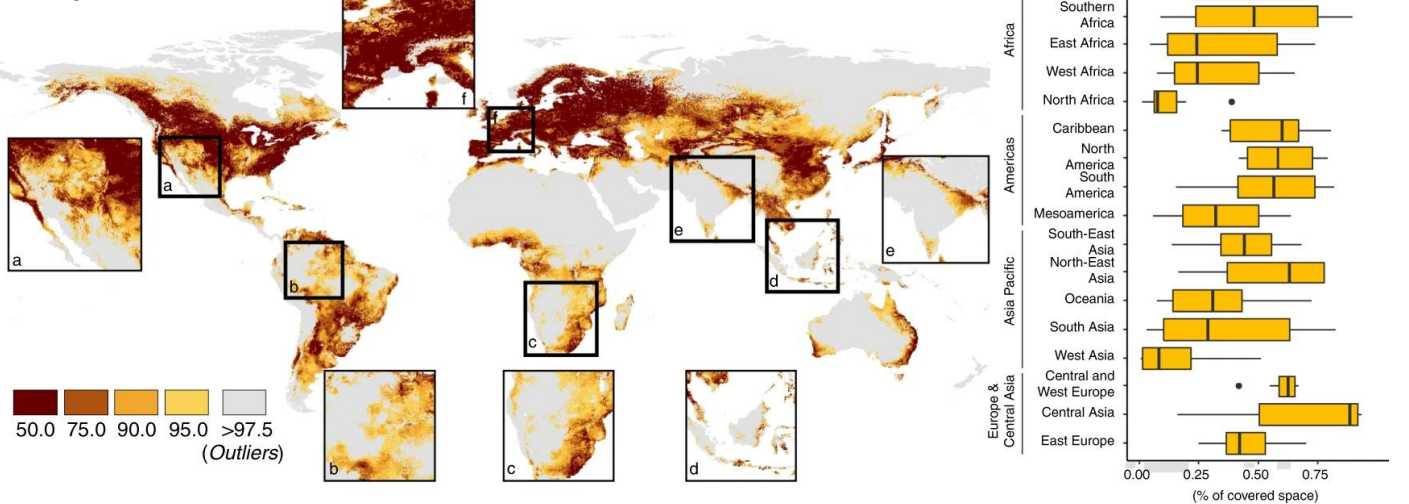
Biomassa



Biodiversidade



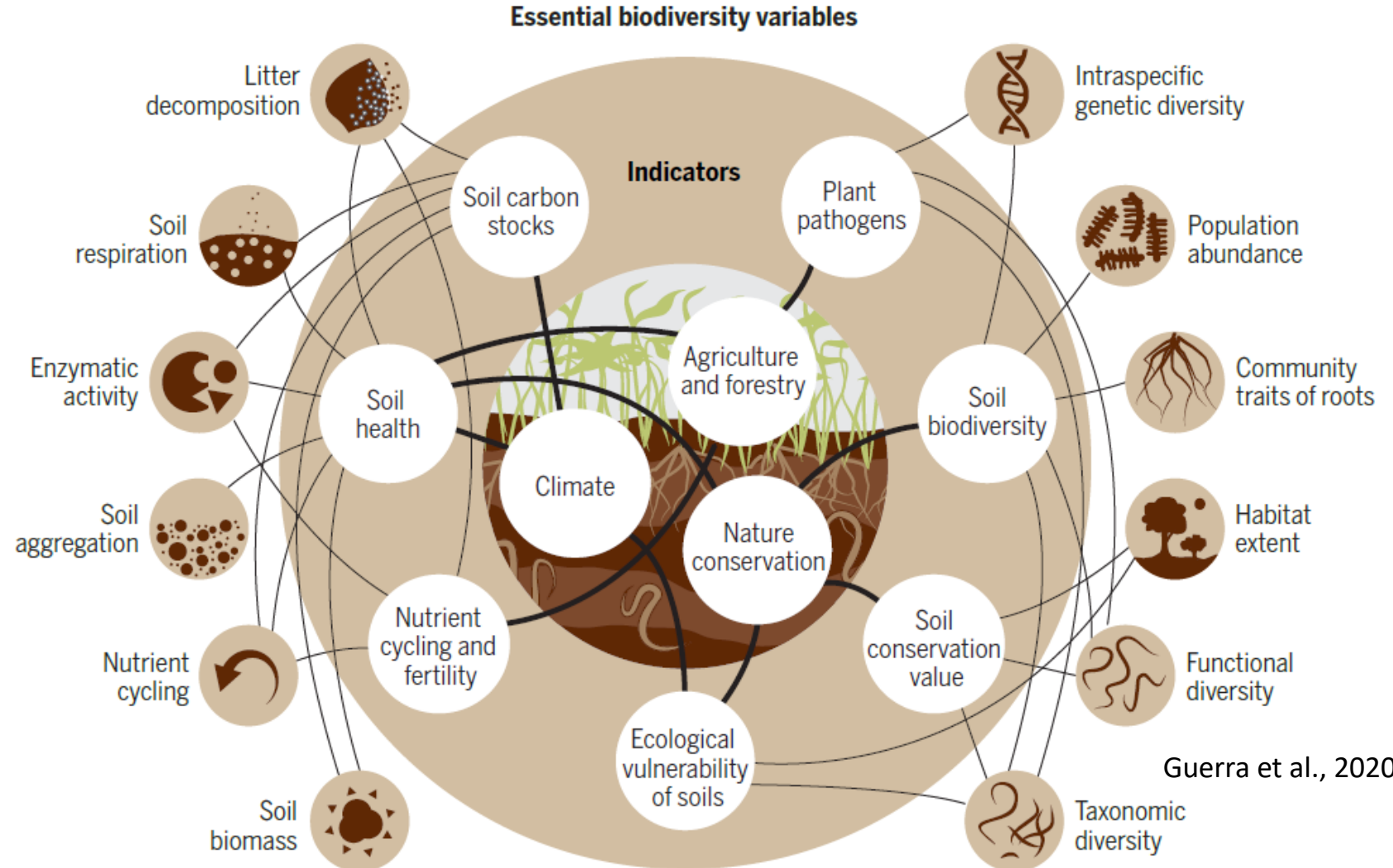
Função

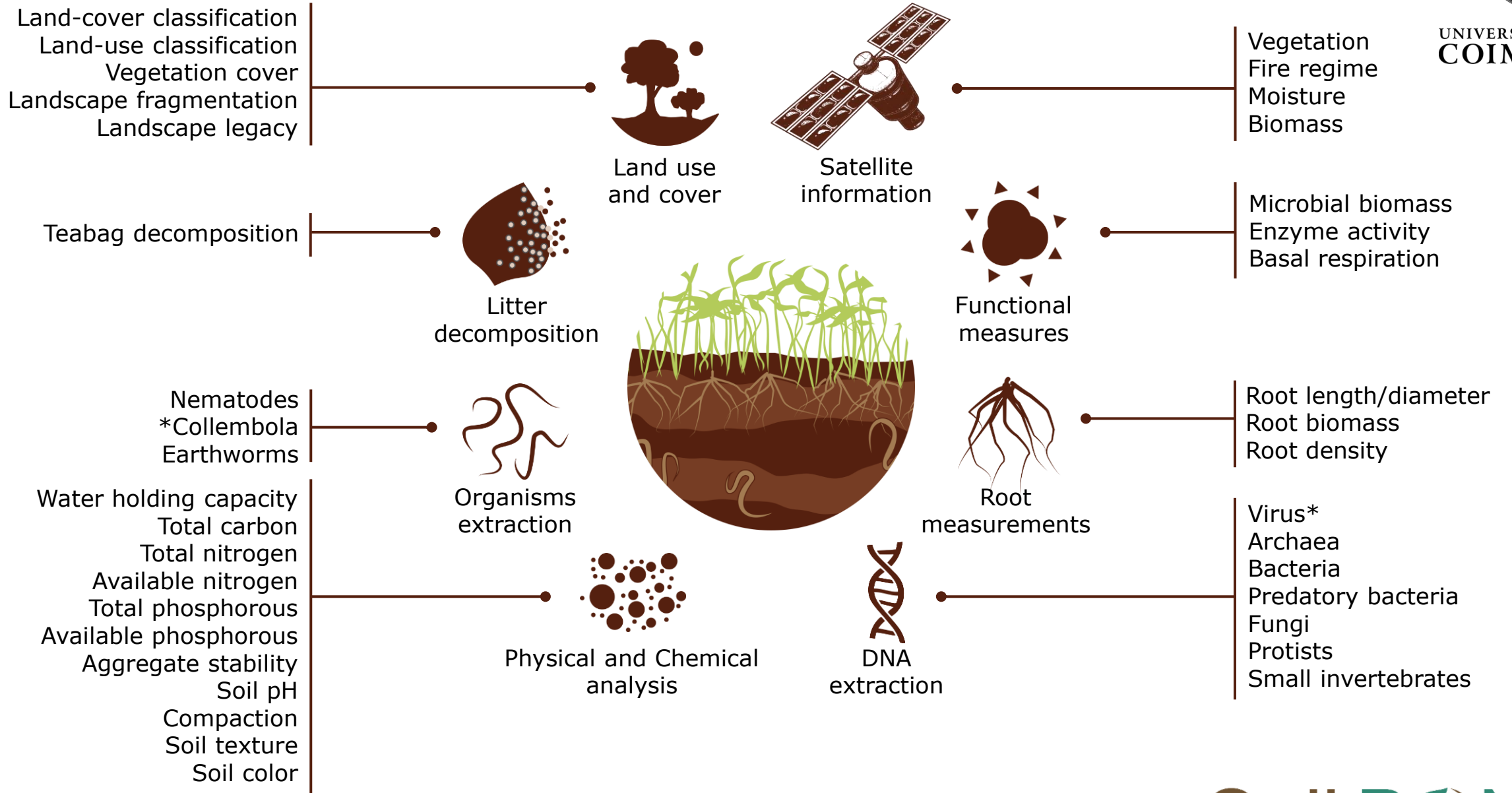




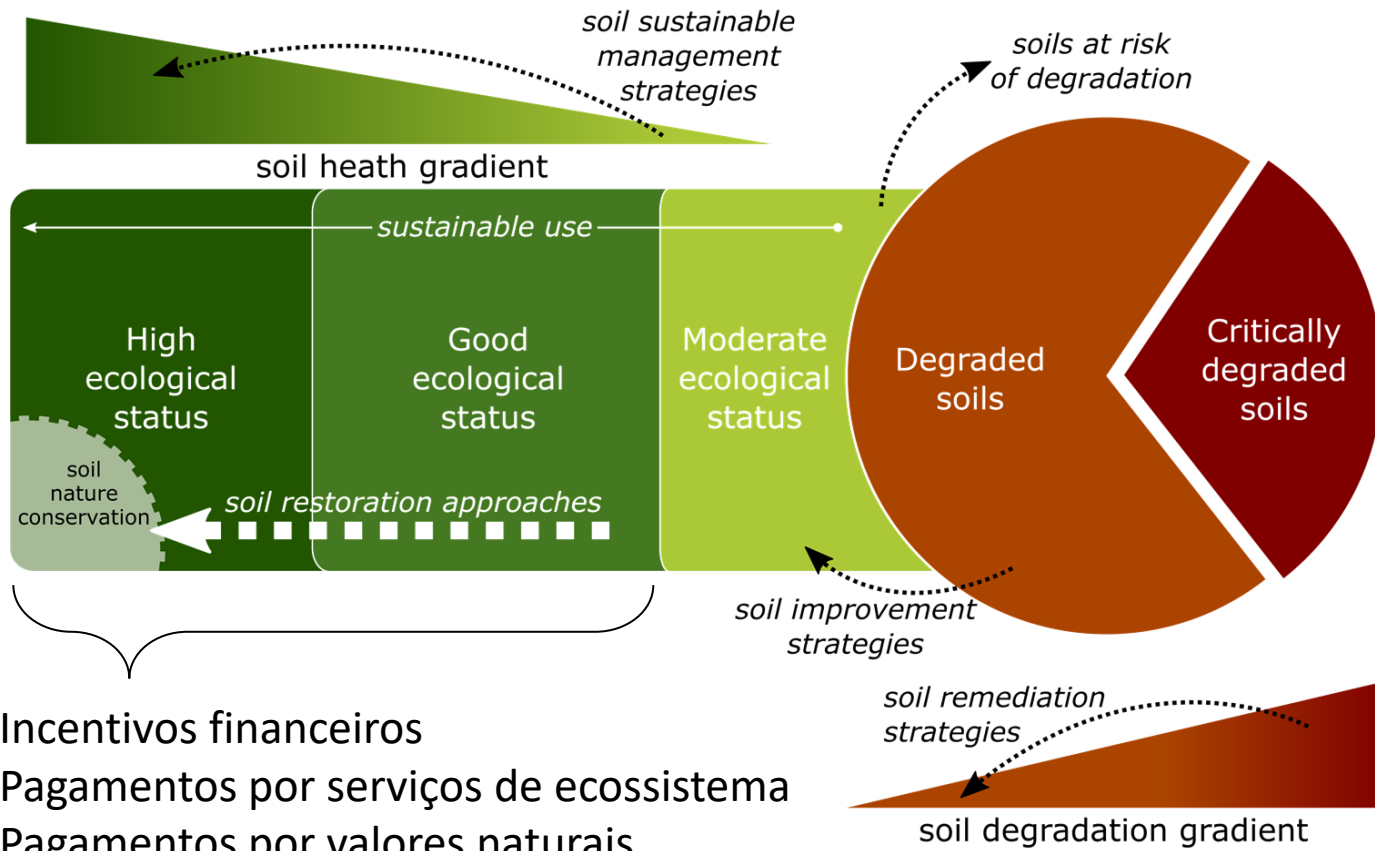
Tracking, targeting, and conserving soil biodiversity

A monitoring and indicator system can inform policy



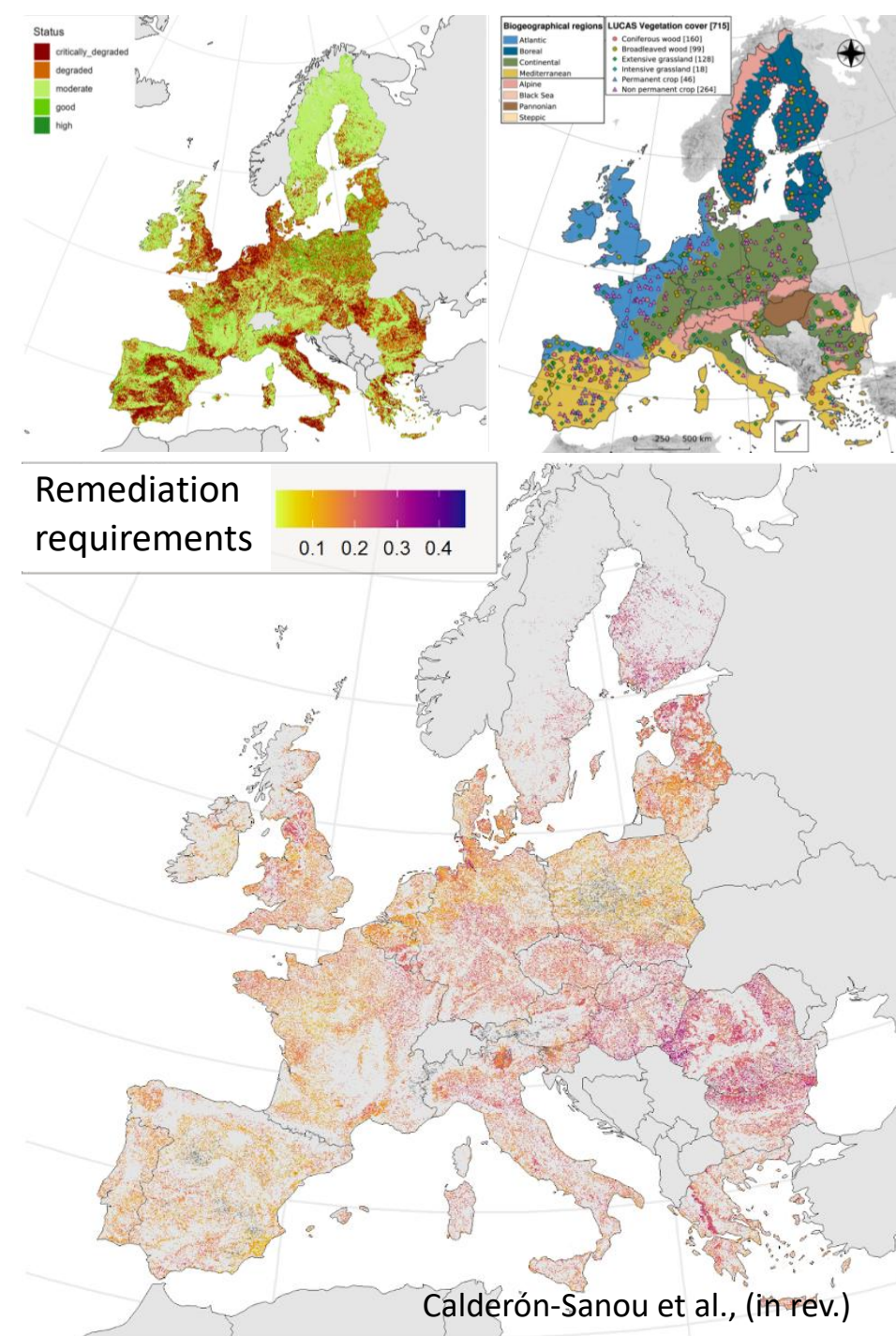


Um sistema de classificação ecológica



- Incentivos financeiros
- Pagamentos por serviços de ecossistema
- Pagamentos por valores naturais
- Guias para o restauro do solo
- Incentivos ao restauro do solo
- Ganhos comerciais

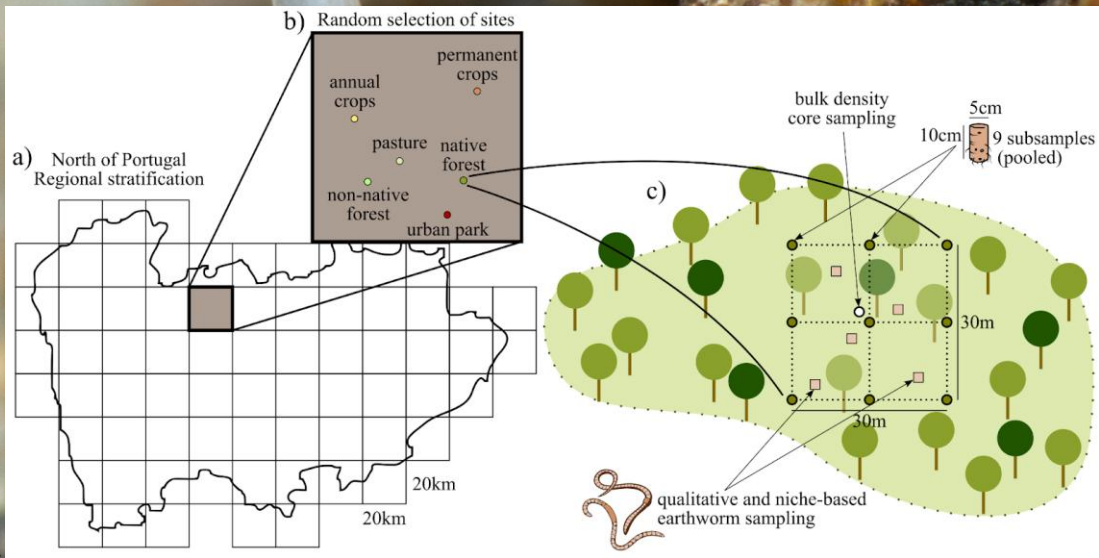
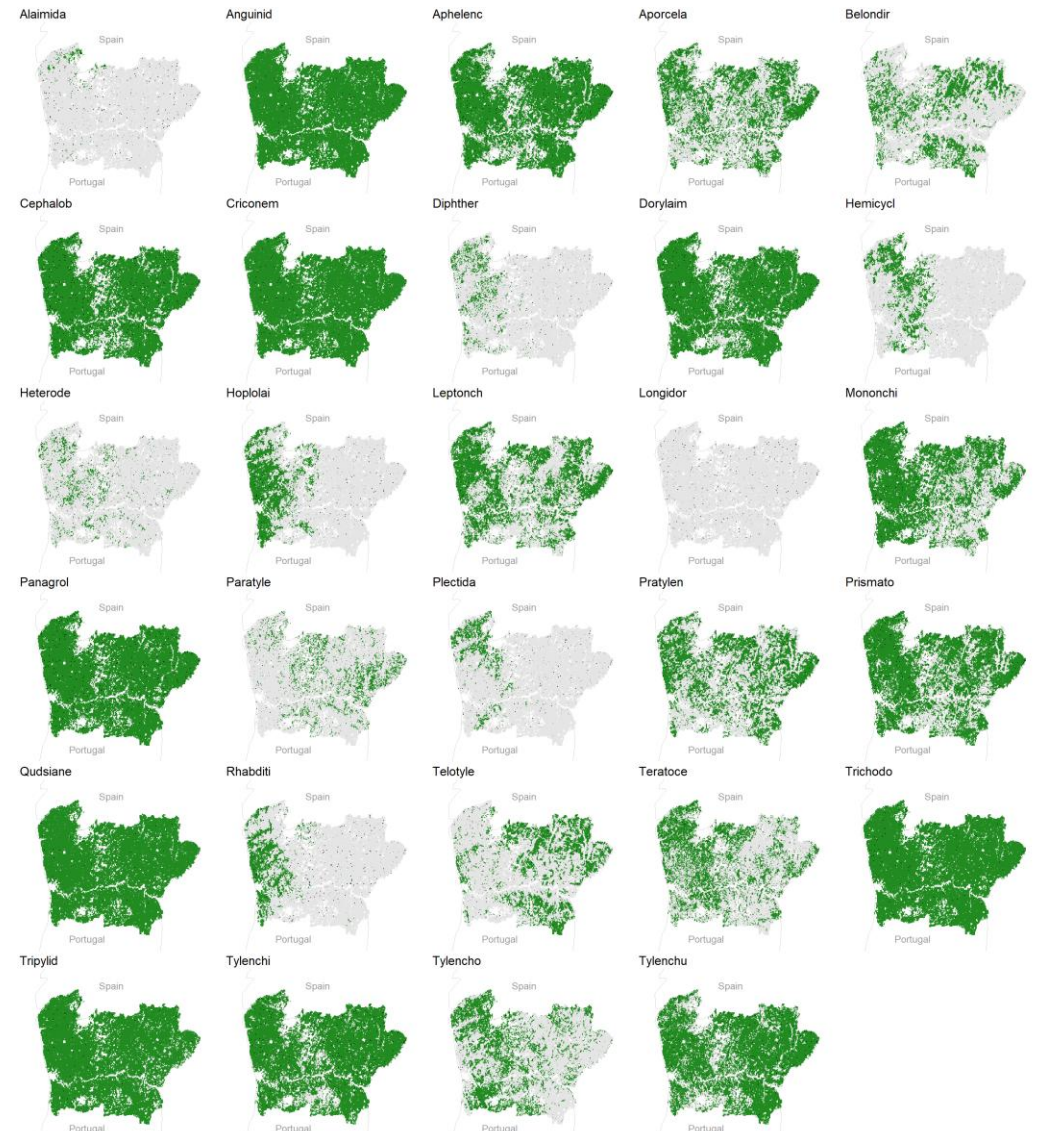
- Incentivos para a alteração das práticas de gestão
- Apoio para pequenos agricultores
- Guias para a remediação de impactes



Nematodes parasitas na região norte de Portugal

FCT

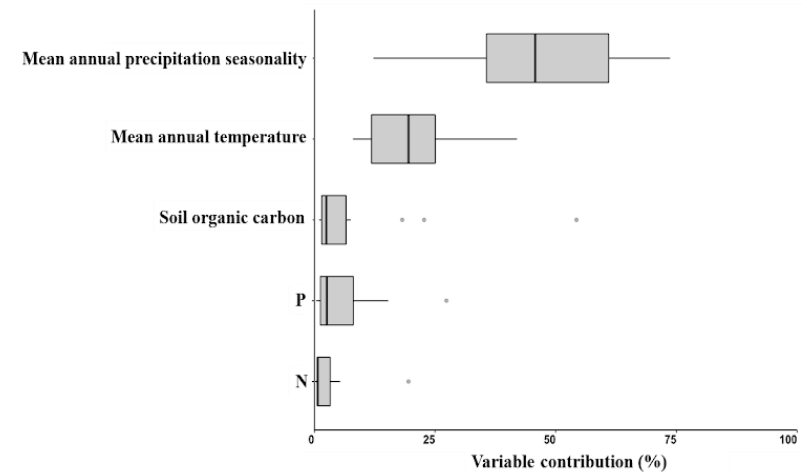
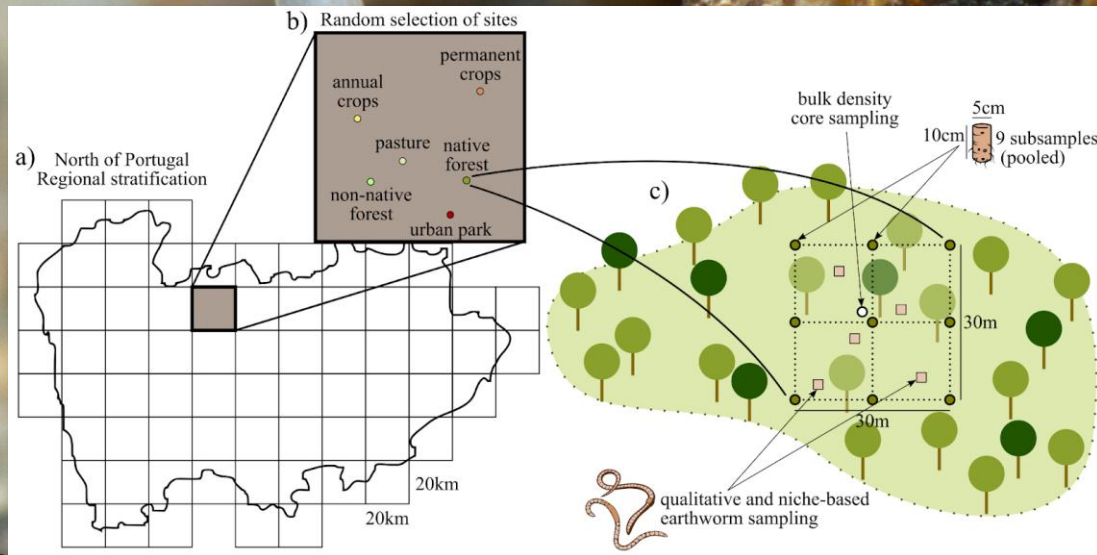
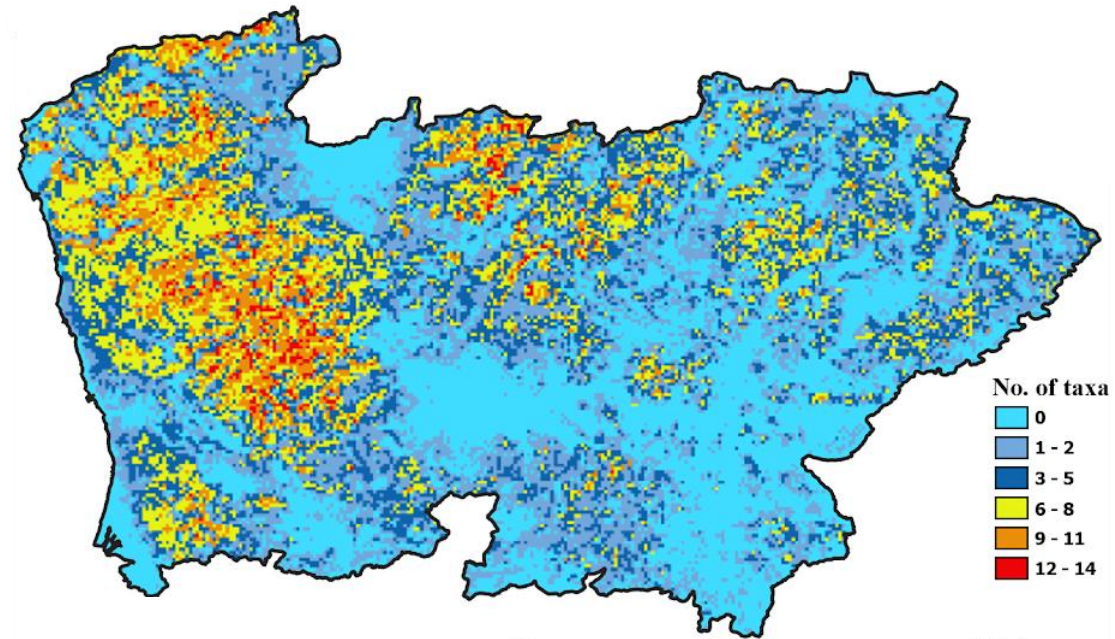
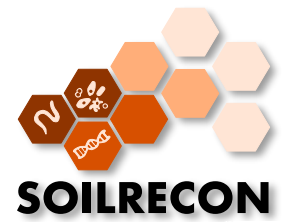
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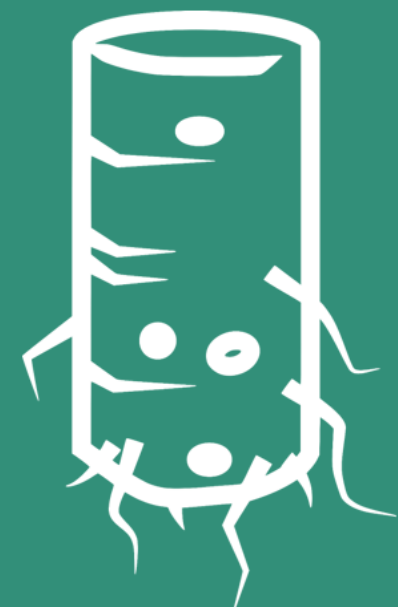


Nematodes parasitas na região norte de Portugal

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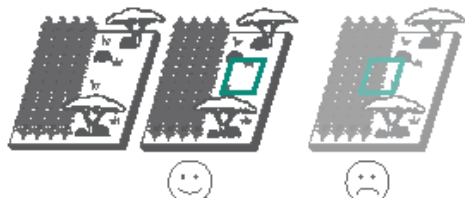


Establish plot

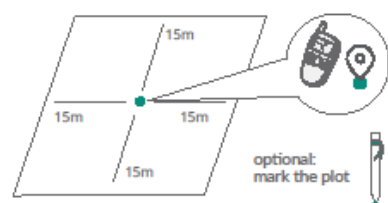
- Identify the correct location for your plot. Samples should be from a single habitat type, not a transition.
Example 1: Sampling in boreal forest adjacent to grassland.



Example 2: Sampling in savannah adjacent to cropland.



- Define the central point of the plot and take GPS coordinates. Ensure LAND USE sample homogeneity across 9 subsamples.

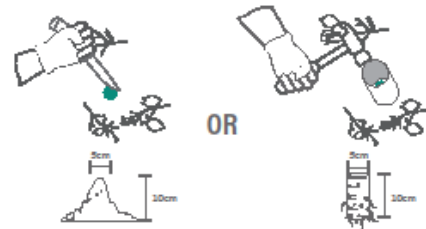


Collect samples

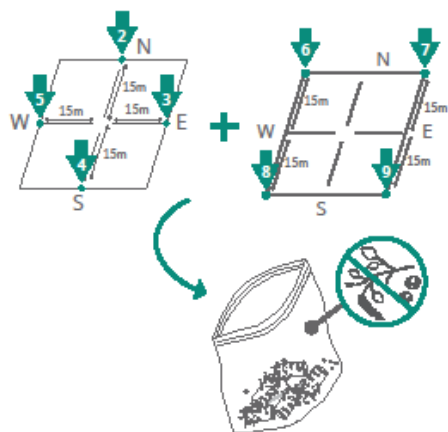
Please organize your sampling only when you are able to ship the soil within one week from sampling.

- Start at the central point of your plot.
 - Put on gloves and remove loose litter layer.
-

- Using the metal soil corer and/or a knife, hammer, or shovel, extract soil with volume 5 cm diameter and 10 cm depth.

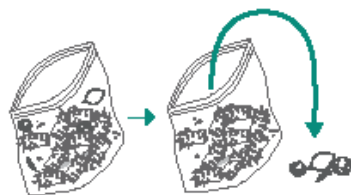


- Place soil in plastic bag.
- Repeat steps 2-4 at sampling points 2-5, then at points 6-9. Remember to use the same plastic bag each time. By the end of this step, you should have nine samples in one bag.



Homogenize samples

- Remove any aboveground vegetation (leaves, twigs, moss, grasses, etc.), big rocks and big animals (bigger than a thumb nail). Remember to leave roots in!



- Close the bag and rub it from the outside by hand. Mix the samples thoroughly but gently so soil becomes a homogenous mixture, but soil aggregates are maintained.



Prepare samples for shipping

- Open bag and remove a subsample to fill the 50mL Falcon tube and 100mL flask.



- Store Falcon tube and flask in a cooler at approx. +4 °C.



- Dry the remaining soil using one of the following methods. Independent of the option, ensure the temperature does not rise above 40 °C.

< 40 °C
< 104 °F

> 40 °C
> 104 °F



DO NOT use a microwave to dry samples. This will kill all microbial activity in the sample.

Paperless drying option:

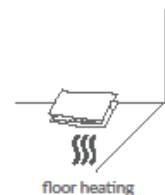


drying oven

To use the following alternative options, ensure that soil is placed in a "paper sandwich" (one piece of paper below the samples, one piece of paper on top) to prevent contamination from UV and airborne contaminants.



closed room under sunlight



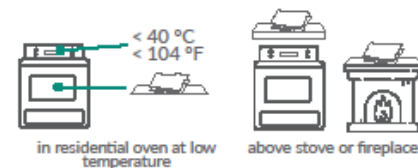
floor heating



under windscreen of car



indoors in dry room



< 40 °C
< 104 °F
in residential oven at low temperature

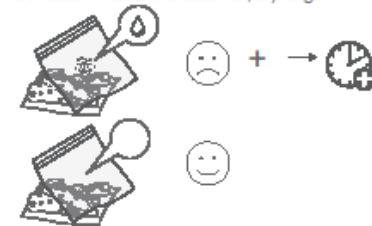


above stove or fireplace



outside under sunlight

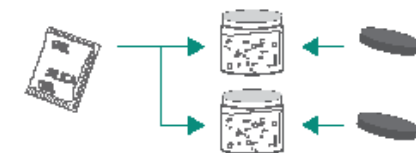
- To ensure the samples have dried properly, cover the sample with the plastic bag and observe if any moisture is emitted. If moisture is observed, dry longer.



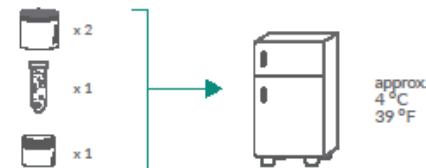
- Fill shipping buckets with dried samples.



- Step 6: Add silica bag inside of each bucket and close lid.



- Store all samples in a fridge or cooler at 4 °C until you ship them (no longer than one week).



approx.
4 °C
39 °F

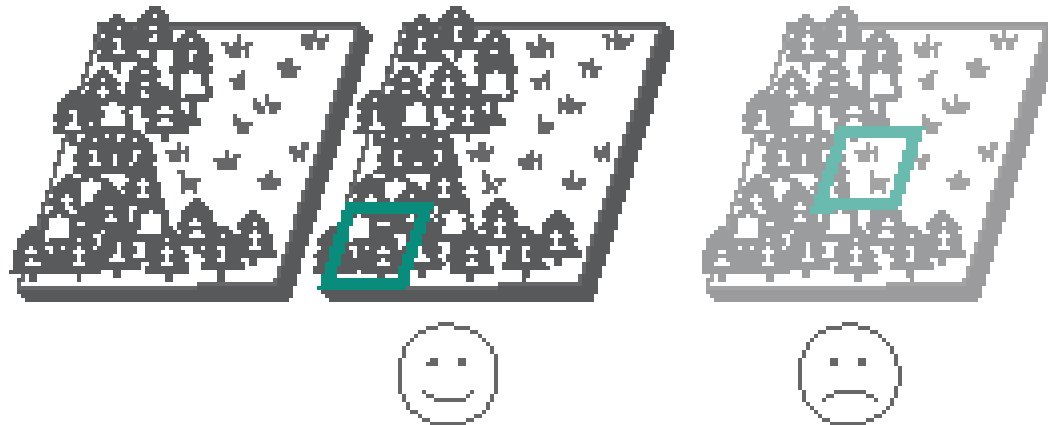
- Contact Soil BON to coordinate shipping.



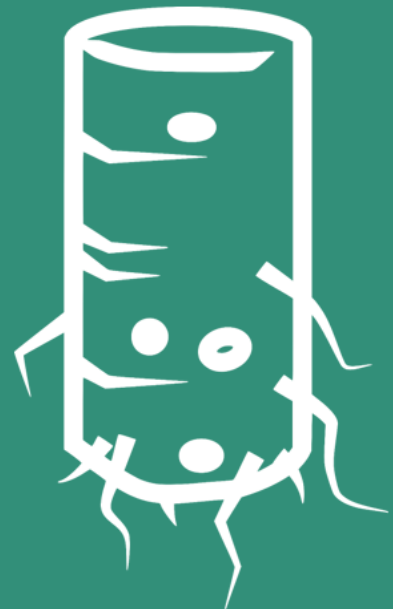
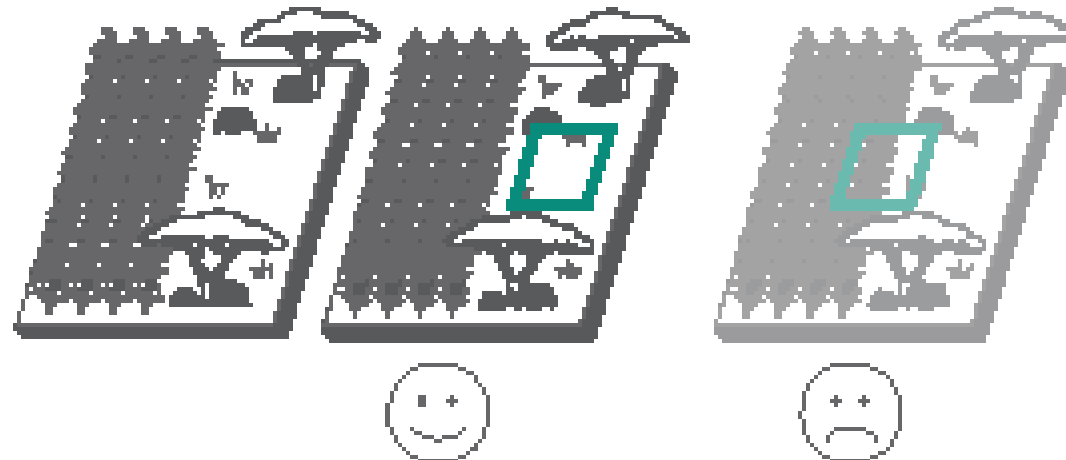
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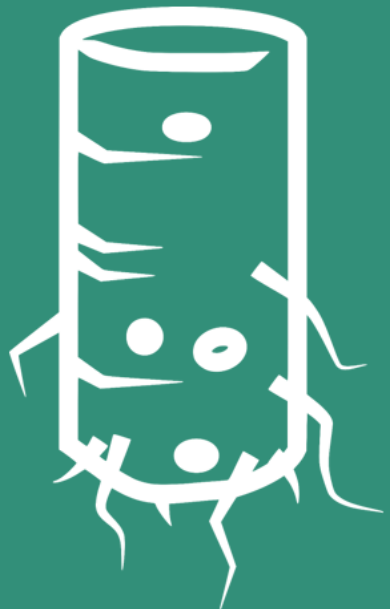
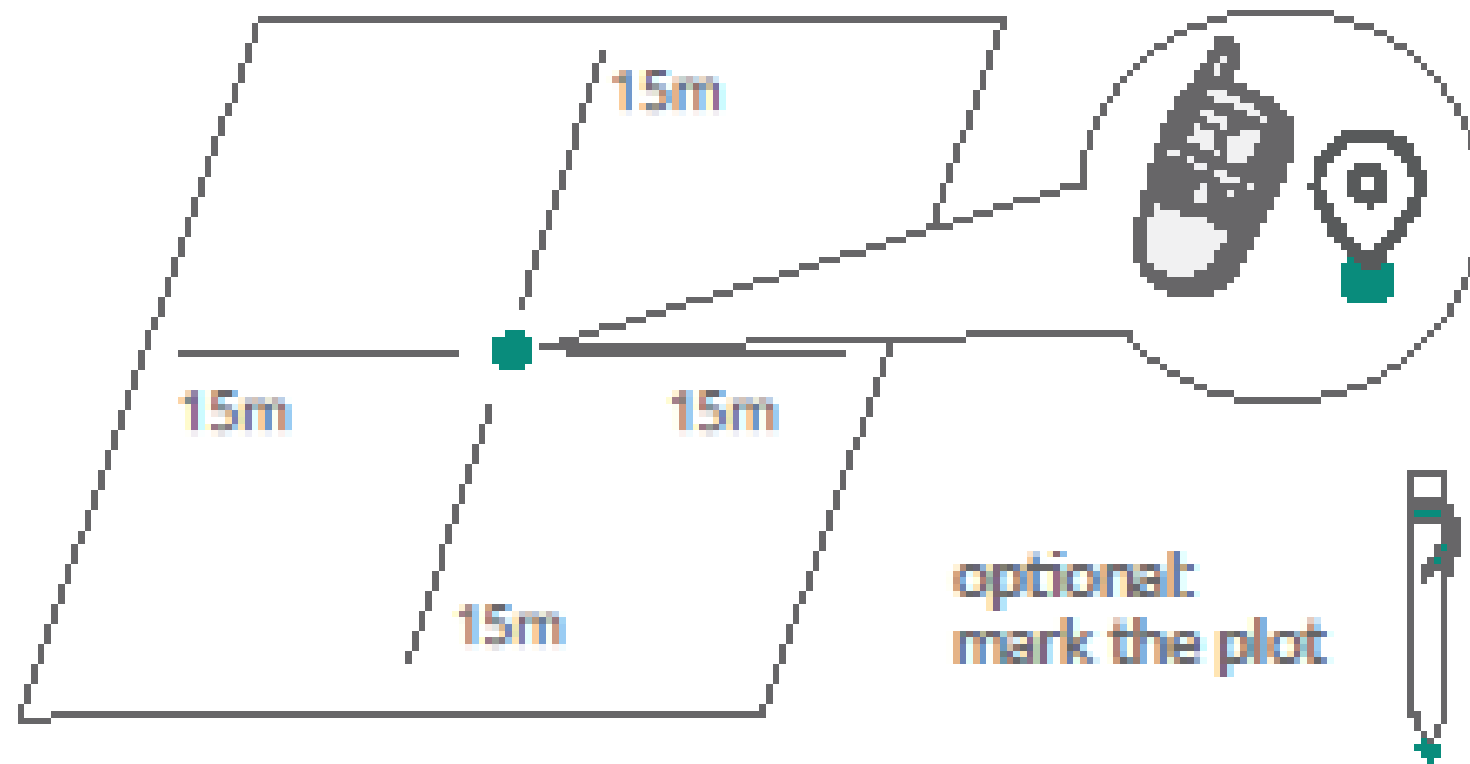
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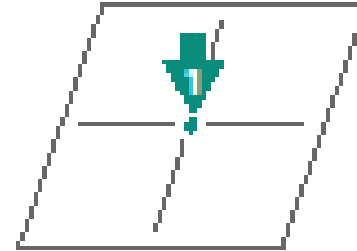
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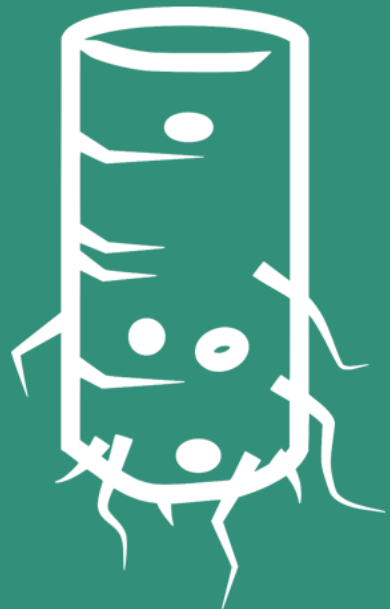
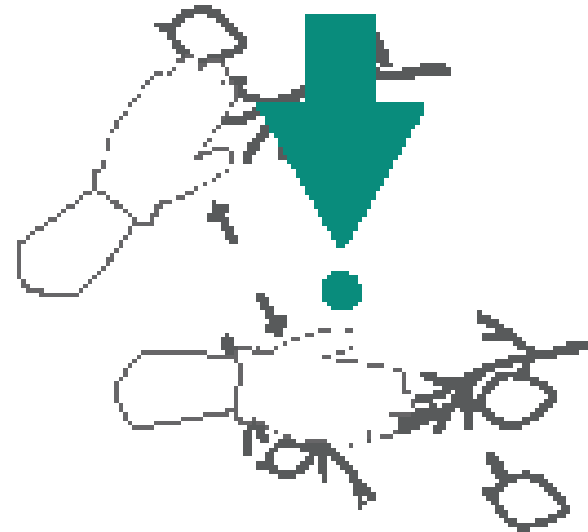
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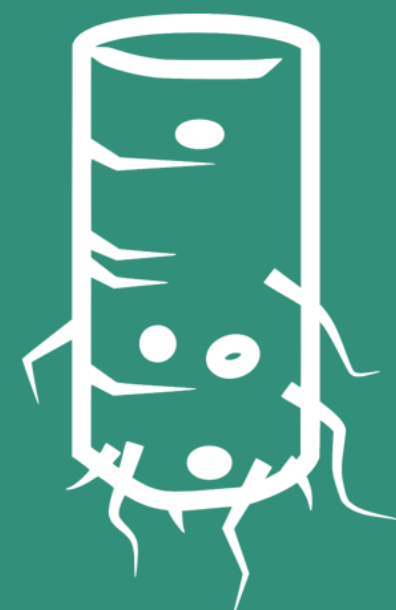
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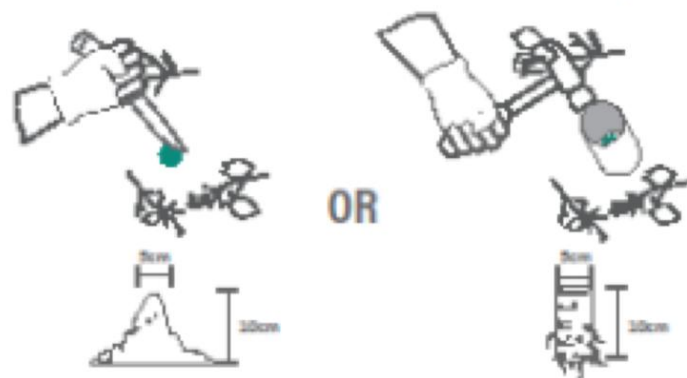


- 2 Put on gloves and remove loose litter layer.



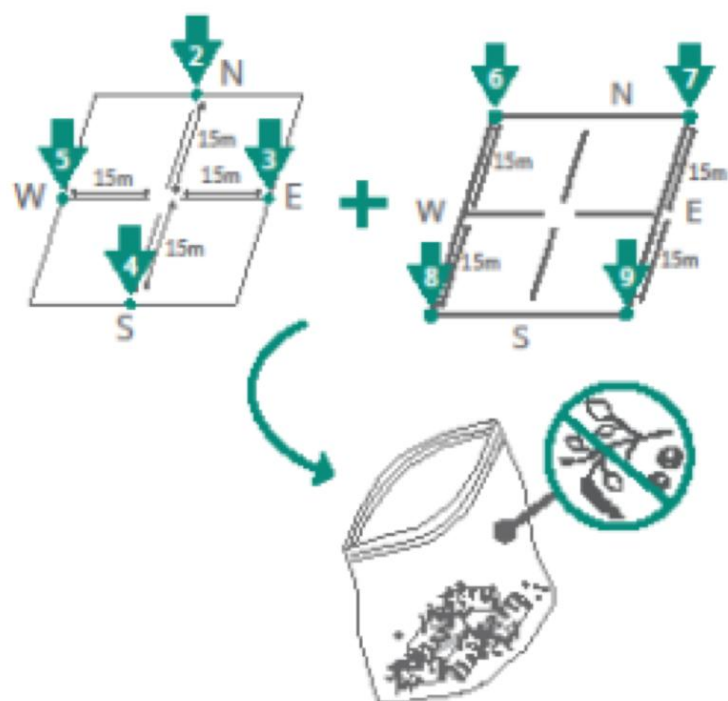


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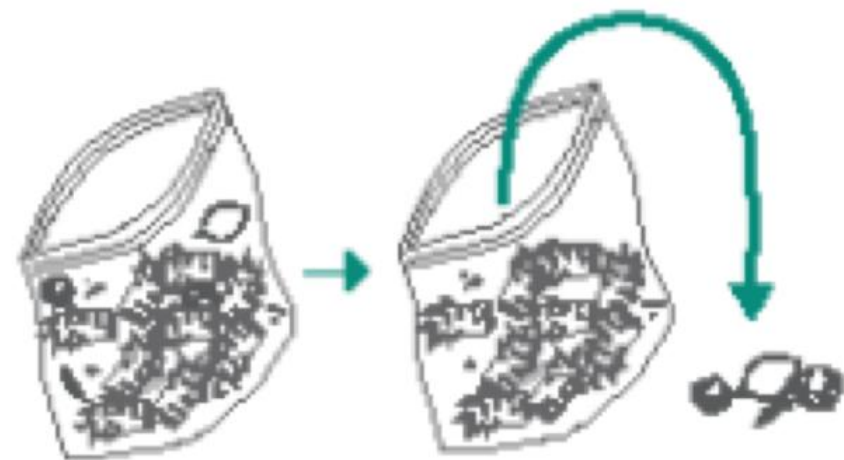
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- 5 Repeat steps 2-4 at sampling points 2-5, then at points 6-9. Remember to use the same plastic bag each time. By the end of this step, you should have nine samples in one bag.



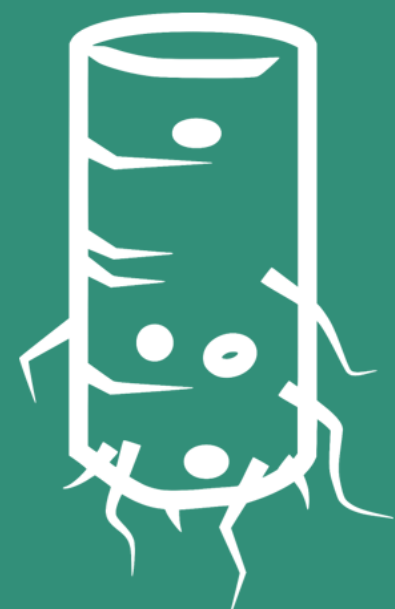
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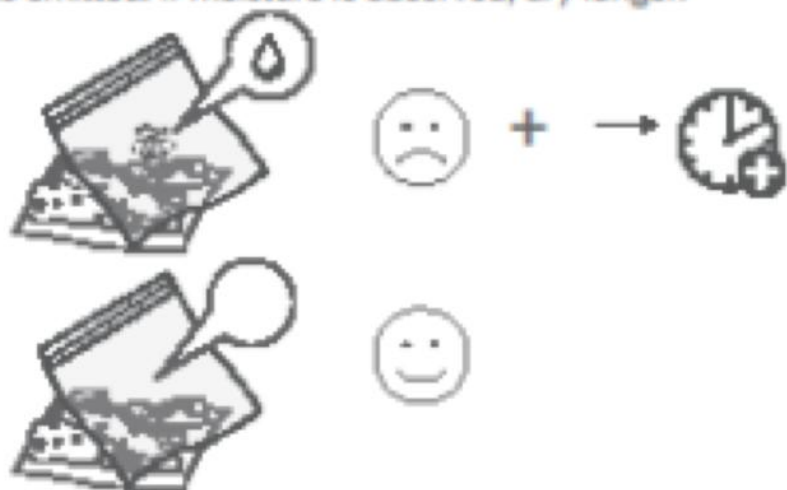


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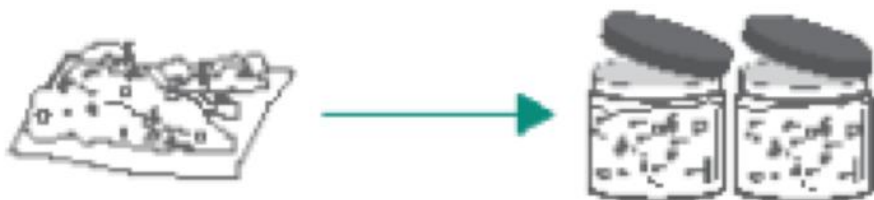




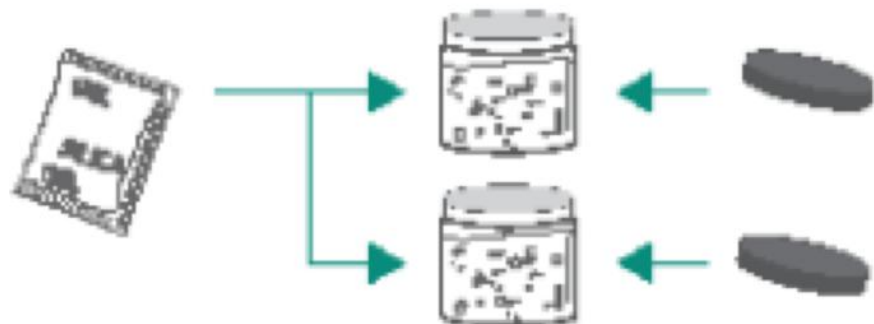
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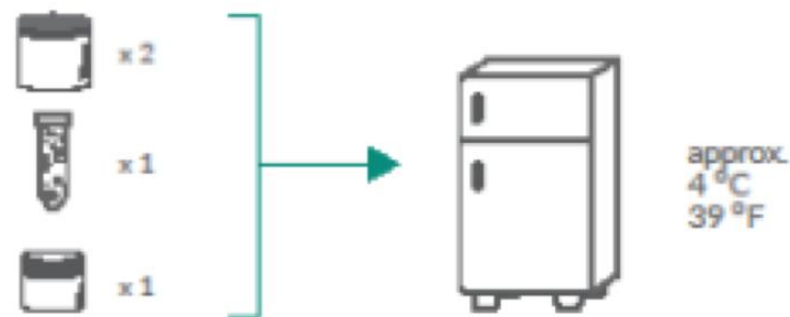
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- 6** Step 6: Add silica bag inside of each bucket and close lid.



- 7** Store all samples in a fridge or cooler at 4 °C until you ship them (no longer than one week).



- 8** Contact Soil BON to coordinate shipping.

