Background

Soil ecosystems around the world are currently either directly or indirectly affected by human influences. This often poses a challenge on the performance and survival of species inhabiting these ecosystems, and alter the interactions between species. Examples of such disturbances are:

- the application of different kinds of pesticides
- pollution of ecosystems with toxic waste products
- changing abiotic conditions due to climate change.

Experimentally test how this affects ecosystems and their functions, like food production and water storage, is difficult. With traditional equipment it is often impossible to manipulate multiple abiotic factors simultaneously and reach ranges of extreme events.

CLIMECS setup

This setup consists of forty ø17cm x 12cm soil samples collected from nature, thereby containing intact soil microbial, arthropod and plant communities, each sample is placed in a microcosm in the laboratory.

Every microcosm can individually be exposed to a different treatment, such as a pesticide application. On top of that the climatic conditions (e.g. temperature profiles and precipitation regimes) can be specifically programmed and monitored in each individual microcosm to create realistic climate scenarios.

Size & trade-offs

As with any experimental setup, there is a trade-off between cost and realism versus the amount of control of variation and possibility to replicate treatments. In our setup, we aimed to reach the middle ground.

In summary

This setup makes it possible to test the joint effects of multiple stressors, which allows researchers to start to disentangle the combined effects of pesticide application and changing climatic conditions on natural soil communities.

Contact

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