



## Technology Offer

### Water content sensor for biological soil crusts

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#### Keywords

**Soil water content sensor, biological soil crusts, BSC, precipitation equivalent**

#### Background

In arid and semiarid regions biological soil crusts (BSC) cover about 1/3 of the soil surface. As far as it is known, these BSC (consisting of cyanobacteria, algae, fungi, bryophytes, and other bacteria living in contact with soil particles) are crucial for the global terrestrial carbon and nitrogen cycle. The water status plays a major role, since their water content directly controls the activity of these poikilohydric organisms.

#### Technology

At the Max Planck Institute for Chemistry for the first time a sensor was developed especially for measuring the water content within the uppermost 5 mm of the BSC. Furthermore, an automatic calibration routine was designed to calculate the water content or precipitation equivalent of the crust sample over time. In contrast to many other sensor types on the market, this sensor is suitable for long-term measurements due to its low-maintenance properties. In combination with its low production costs this allows permanent sensor arrays over large spatial areas.

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**Fig. 1:** Example of one water content sensor within soil.

#### Advantages

- Allows both short- and long-term measurements (low-maintenance properties)
- Low production costs
- High reliability
- Sensor arrays allow assessment of crust activity over large spatial areas
- Software for sensor calibration does exist.
- Data evaluation by means of common data analysis software (e.g. Microsoft Excel)