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Climate change models predict changes in the magnitude and frequency of extreme precipitation events. An increasingly common approach to study the effect of amount and magnitude of precipitation on ecosystems is the use of rainout shelters. However, there are various drawbacks of current designs including long set-up times, expensive materials, and large sizes that cannot be implemented in treed ecosystems. We present a stationary rainout shelter design that is simple in construction, effective in keeping out rain, and can be installed in replicates throughout any ecosystem. The same 10' X 10' rainout shelter design was installed in both a treed peatland and an open grassland, and the microclimate (including temperature, relative humidity, net radiation, photosynthetically active radiation (PAR), wind speed) were monitored both inside and outside of the shelters for one growing season. We found that the shelters blocked 100% of ambient rainfall. There were slightly higher temperatures and relative humidity, and reduced wind speed, net radiation, and PAR inside the shelters relative to the outside in both ecosystems. However, these effects were much more pronounced in the peatland likely as a result from the trees blocking the wind and reducing the mixing of air under the shelters.