

Long-term study shows atmospheric biome fluctuates by season

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A team of researchers with the LTER Environmental Monitoring Observatory in the Aigüestortes National Park in Spain has found that there is seasonal variation in atmospheric microbes. In their paper

published in *Proceedings of the National Academy of Sciences*, the group describes their seven-year study of airborne microorganisms and what they found.

In this new effort, the researchers collected rain and snow samples over the course of seven years from their site high in the Pyrenees. For each sample, the researchers analyzed [microbes](#) looking for two types of rRNA—16S and 18S. The first is found mostly in prokaryotes, which in this case was generally bacteria. The second is found in eukaryotes which includes almost all other living organisms. They also subjected each sample to an overall chemical analysis.

After seven years, the researchers compiled their data and looked for patterns. They report that they found clear seasonal patterns. In winter, for example, bacteria in the air was much more predominant—most of which were typically associated with marine, terrestrial and forest biomes. During the summer, however, things changed—microbial eukaryotes (usually found in freshwater) were the dominant microbes in the air. During the autumn, they saw microbes generally found in forest biomes. The researchers further report that most of the eukaryotes they found were fungi. They note that their findings run contrary to what was believed until now. They also point out that microbes in the atmosphere eventually come back down to Earth, often in places far from where they were pulled into the air—sometimes on a different continent.

The researchers suggest work like theirs is becoming more important as the Earth's climate changes. Growing deserts, for example, mean more microbes found in sand are likely to become airborne—though no one really knows if that might cause any rippling effects. They point out that the impact of the atmospheric biome is still unclear as is what might happen if it changes. They note such lack of information suggests the world's scientific community needs to establish a global network of sampling stations with [researchers](#) sharing what they find with others.

More information: Joan Cáliz et al. A long-term survey unveils strong seasonal patterns in the airborne microbiome coupled to general and regional atmospheric circulations, *Proceedings of the National Academy of Sciences* (2018). [DOI: 10.1073/pnas.1812826115](https://doi.org/10.1073/pnas.1812826115)

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