



Early Flowering Signals Global Warming

An emaciated polar bear stranded on an ice floe in the open ocean. Images like this are often used to illustrate the dramatic consequences of global warming. When they report on climate change, media outlets tend to reach for powerful images. “But this runs the risk that many people might think it is something that doesn’t really affect them personally. The Arctic is so far removed from everyday life,” as Annette Menzel, Professor of Ecoclimatology at TUM, states. But in fact even at our latitudes, climate change has long altered the seasonal rhythms of our fauna and flora. Birds are nesting earlier. Plants are coming into leaf and flowering earlier than even just a few years ago. Fruit is ripening earlier and trees are shedding their leaves later.

The study of these seasonal events is known as phenology. Changes in the timing of such events can be clearly shown to be related to global warming. Annette Menzel has analyzed data from across Europe, which, between 1971 and 2000, recorded the phenology of 542 plant and 19 animal species. Her analysis shows that a one degree Celsius mean rise in late winter temperatures shifts spring phenology forward by an average of 2.5 to 5 days. Now, Bavarians can become citizen scientists and research these correlations for themselves. “Budding, flowering,

ripening of fruit, autumn leaf coloration and leaf drop are easy to observe and citizen scientists can record these details using the new BAYSICS app, where the observations can be linked to German Meteorological Service data going back to 1951,” explains Menzel. There is also a new software package for evaluating winter twig experiments. This allows users to look back into the past, but also to get a glimpse of the future, explains the professor. “We can use statistical models to simulate the effects of rising temperatures on the natural world.”

The ability to run simulation experiments like this sets the BAYSICS app apart from commercial software. “People can play with real datasets and try out different climate change scenarios. We aim to make science fun, while still managing to showcase complex interrelationships,” explains Menzel. She hopes the app will also benefit her research. Little is known, for example, about why horse chestnuts produce new flowers in autumn, or whether street lights affect autumn leaf coloration. Similarly, it’s not clear whether fruit tree blossoms are being destroyed by late frosts more often than in the past. “If enough people join in, we will be able to collect data for the first time on a wide range of poorly researched phenomena.”

Monika Offenberger

“If enough people join in, we will be able to collect data for the first time on a wide range of poorly researched phenomena.”

Annette Menzel, TUM