

## Seasonal impressions of nature: Creatively exploring phenology through an intuitive learning activity

### Introduction

The study of plant phenology, observing recurring patterns in phases of plant development, has been an important part of agriculture and horticulture for generations, helping inform decision making and the timing of cultural practices (Chmielewski, 2013; Piao et al., 2019). However, phenological observations outside the main growing period, such as in wintertime, have often been difficult due to its environmental characteristics like colder temperatures, shorter days, snow, and ice. In many fields and disciplines work involving winter is often only considered enough to minimize its burden on human systems and infrastructure making it a neglected season otherwise (Contosta et al., 2020). The effects of climate change, however, are altering long-standing patterns of temperatures and precipitation, especially in winter (IPCC, 2022). There is therefore a need to help facilitate a reconnection and forge new connections with the winter season broadly, and more specifically in terms of training students in noticing nature in wintertime.

#### *The course context*

The activity was piloted in a mixed undergraduate/graduate course at the University of Stuttgart, in Germany called 'Winterscapes: Designing Solutions to Enhance Engagement with Urban Nature'. Students in the course were primarily master students studying Architecture and Urban Planning and Integrated Urbanism and Sustainable Design. The course's overall objective was to challenge previously held conceptualizations of winter through exploring the barriers and opportunities of the season. Specific learning objectives included, for example, being able to enumerate and describe benefits and barriers towards connecting with nature in the wintertime as well as develop engaging participatory activities to increase human-nature interactions in winter.

The activity was originally conceptualized by Leonie K. Fischer at the Technical University of Berlin and then further developed by her and her interdisciplinary team at the Institute of Landscape Planning and Ecology at the University of Stuttgart. It was then adjusted and adapted to fit the context of the Winterscapes course conducted in February 2024.

### Procedure

Students were introduced to the activity at an orientation meeting in October four months prior to the official start of the course. In this individual activity the students selected an outdoor location in Stuttgart that included living and non-living natural elements (e.g. plants, stones,

water). They were instructed to visit their selected location for at least 30 minutes once per month (October-January; four observations) and collect their spontaneous impressions of the place, without thinking too much about how their observations might connect with the topic of the course. It was suggested to consider how this place made them feel, what they noticed using all five senses, and to pay particular attention to how their selected location and their observations changed over the course of the four months.

The students were encouraged to creatively document and present their impressions, for example by writing notes, making sketches, taking photographs, video and sound recordings, or collecting objects from their location at each visit. Impressions were shared by students via rapid presentations (3-5 minutes followed by short group discussion) on the first official day of the course in February.

Students used a diverse range of formats to present impressions of seasonal changes at their location, including narrated video clips, an original music video composed of sounds collected from the natural elements at their location (e.g. crunching leaves and snow, snapping twigs), watercolor paintings, time photo series, maps, multimedia journals, and reflective diary entries (Fig. 1).

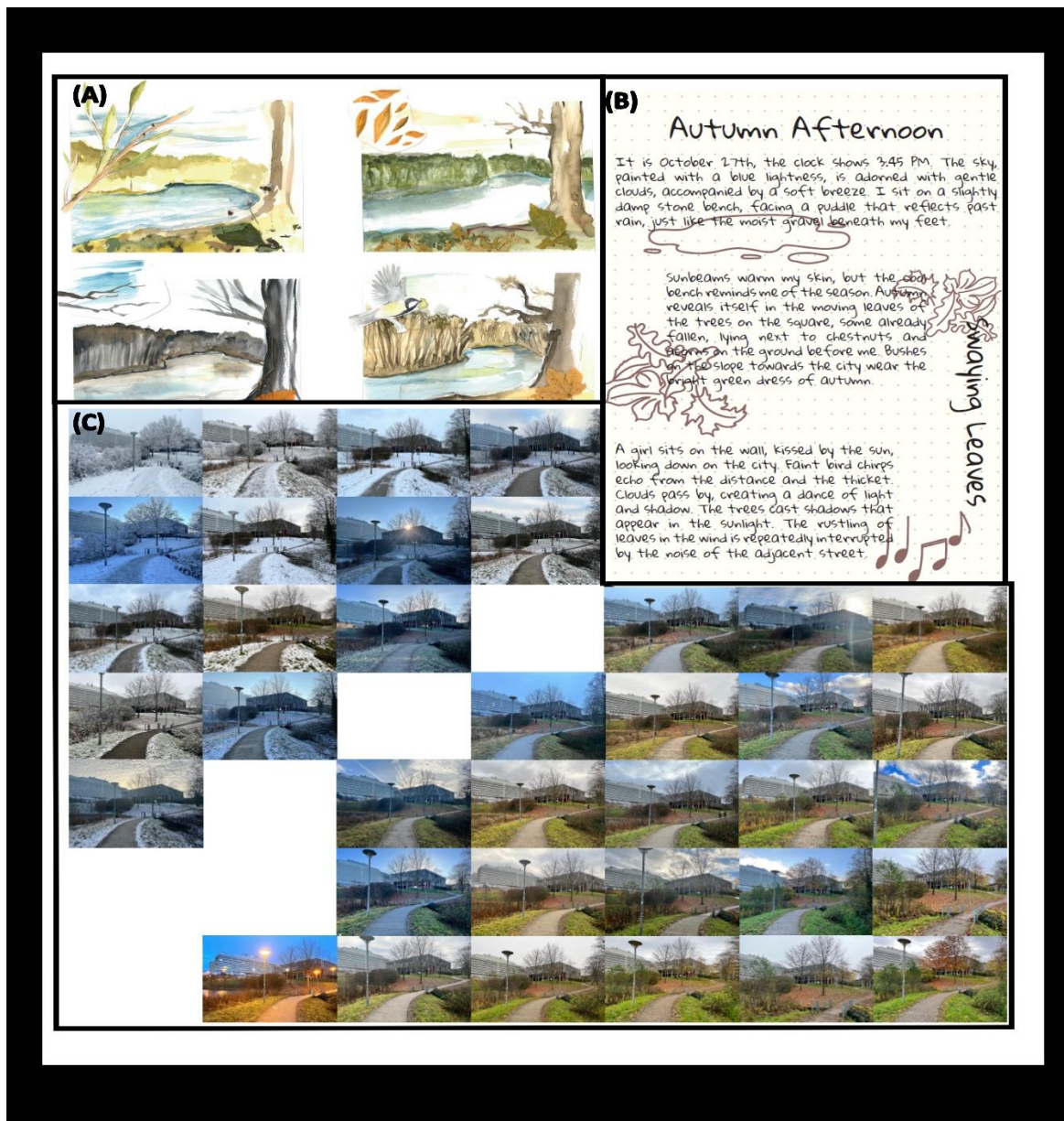


Figure 1. Snapshots of student seasonal observation examples. (A) Watercolor paintings. Credit: Linnea Herlevi. (B) Journal entry. Credit: Anonymous student. (C) Time series photo collage. Credit: Ajaykumar Chandran.

The most frequently depicted theme that students highlighted in their presentations was the seasonal transition from autumn to winter, which included aspects like dropping temperatures, transition to dormant vegetation, and presence of snow and ice. Students often shared in the discussions that these transitions in nature often reflected how their own emotions and energy levels changed from October through February.

## Assessment

This preliminary activity before the official start of the course, afforded the students the opportunity to observe a single outdoor location over four months to collect impressions on how the space, including the vegetation, changed with the seasonal transition from autumn to winter. The activity allowed the students to begin engaging with various aspects of seasonality – a primary focus of the course – in a creative manner. The outcomes demonstrate that both the space and its associated abiotic conditions, such as temperature and precipitation, and biotic conditions like leaf color changes were important aspects in students' representations of change. Additionally, the short presentations on the first day allowed students to introduce themselves to the instructors and classmates in a deeper and more insightful way beyond the typical sharing of name, study line, and favorite free time activity. This more informative introduction was conducive for the subsequent self-forming student groups for the main assignment of the course, facilitating student insight into one another's creative processes, worldviews, and work styles. While the majority of students' observational locations were in urban areas and not traditional agricultural or horticultural landscapes, the application of both the activity and outcomes can apply more broadly across these areas of study in three main ways. First, the activity was successful in facilitating students actively noticing nature, and specifically vegetation, in the winter season. Second, the activity was framed as an intuitive process that subtly engaged students in observing ecological phenology from the end of the vegetative period into dormancy without the burden of disciplinary jargon or formal observational methodology. This allowed students to more naturally familiarize themselves with nearby nature and cultivate intuitive ways of knowing. Third, definitions of what constitute agricultural or horticultural landscapes are becoming increasingly fuzzy due to the necessary growth of urban agriculture and increased interest in urban gardening (Lal, 2020).

## Author Contact Information

Michael R. Barnes

- Affiliation: University of Minnesota Twin Cities, Department of Horticultural Science
- Contact: [mrbarne@umn.edu](mailto:mrbarne@umn.edu)

Kristen Jakstis

- Affiliation: University of Stuttgart, Institute of Landscape Planning and Ecology, Stuttgart, Germany
- Contact: [kristen.jakstis@ilpoe.uni-stuttgart.de](mailto:kristen.jakstis@ilpoe.uni-stuttgart.de)

Leonie K. Fischer

- Affiliation: University of Stuttgart, Institute of Landscape Planning and Ecology, Stuttgart, Germany
- Contact: [Leonie.Fischer@ilpoe.uni-stuttgart.de](mailto:Leonie.Fischer@ilpoe.uni-stuttgart.de)

## References

Chmielewski, FM. (2013). Phenology in Agriculture and Horticulture. In: Schwartz, M. (eds) Phenology: An Integrative Environmental Science. Springer, Dordrecht. [https://doi.org/10.1007/978-94-007-6925-0\\_29](https://doi.org/10.1007/978-94-007-6925-0_29)

Contosta, A. R., Casson, N. J., Nelson, S. J., & Garlick, S. (2020). Defining frigid winter illuminates its loss across seasonally snow-covered areas of eastern North America. *Environ. Res. Lett.*, 15(3), 034020. <https://doi.org/10.1088/1748-9326/ab54f3>

IPCC (2022). Climate change 2022: Impacts, adaptation, and vulnerability. Contribution of working group II to the sixth assessment report of the Intergovernmental Panel on Climate Change. H-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, & B. Rama (Eds.). Cambridge University Press. Cambridge University Press, Cambridge, UK and New York, NY, USA. <https://doi.org/10.1017/9781009325844>.

Lal, R. (2020). Home gardening and urban agriculture for advancing food and nutritional security in response to the COVID-19 pandemic. *Food Security*, 12, 871-876. <https://doi.org/10.1007/s12571-020-01058-3>

Piao S, Liu Q, Chen A, et al. Plant phenology and global climate change: Current progresses and challenges. *Glob Change Biol.* 2019; 25: 1922–1940. <https://doi.org/10.1111/gcb.14619>

**Submitted by:**

Michael Barnes  
University of Minnesota  
Minneapolis, MN

Kristen Jakstis  
University of Stuttgart  
Stuttgart, Germany

Leonie Fischer  
University of Stuttgart  
Stuttgart, Germany