Data Standards for the Phenology of Plant Specimens

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Abstract

Phenological data (i.e., data on growth and reproductive events of organisms) are increasingly being used to study the effects of climate change, and biodiversity specimens have arisen as important sources of phenological data. However, phenological data are not expressly treated by the Darwin Core standard (Wieczorek et al. 2012), and specimen-based phenological data have been codified and stored in various Darwin Core fields using different vocabularies, making phenological data difficult to access, aggregate, and therefore analyze at scale across data sources. The California Phenology Network, an herbarium digitization collaboration launched in 2018, has harvested phenological data from over 1.4 million angiosperm specimens from California herbaria (Yost et al. 2020). We developed interim standards by which to score and store these data, but further development is needed for adoption of ideal phenological data standards into the Darwin Core. To this end, we are forming a Plant Specimen Phenology Task Group to develop a phenology extension for the Darwin Core standard. We will create fields into which phenological data can be entered and recommend a standardized vocabulary for use in these fields using the Plant Phenology Ontology (Stucky et al. 2018, Brenskelle et al. 2019). We invite all interested parties to become part of this Task Group and thereby contribute to the accesibility and use of these valuable data. In this talk, we will describe the need for plant phenological data standards, current challenges to developing such standards, and outline the next steps of the Task Group toward providing this valuable resource to the data user community.

Keywords

Darwin Core, herbarium specimens

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Conflicts of interest

References

- Brenskelle L, Stucky B, Deck J, Walls R, Guralnick R (2019) Integrating herbarium specimen observations into global phenology data systems. Applications in Plant Sciences 7 (3): e01231 . https://doi.org/10.1002/aps3.1231
- Stucky B, Guralnick R, Deck J, Denny E, Bolmgren K, Walls R (2018) The Plant Phenology Ontology: A New Informatics Resource for Large-Scale Integration of Plant Phenology Data. Frontiers in Plant Science 9: 90 -97. https://doi.org/10.3389/fpls.2018.00517
- Wieczorek J, Bloom D, Guralnick R, Blum S, Döring M, Giovanni R, Robertson T, Vieglais D (2012) Darwin Core: An Evolving Community-Developed Biodiversity Data Standard. PLoS ONE 7 (1): e29715. https://doi.org/10.1371/journal.pone.0029715
- Yost J, Pearson K, Alexander J, Gilbert E, Hains LA, Barry T, Bencie R, Bowler P, Carter B, Crowe R, Dean E, Der J, Fisher A, Fisher K, Flores-Renteria L, Guilliams CM, Hatfield C, Hendrickson L, Huggins T, Janeway L, Lay C, Litt A, Markos S, Mazer S, McCamish D, McDade L, Mesler M, Mishler B, Nazaire M, Rebman J, Rosengreen L, Rundel P, Potter D, Sanders A, Seltmann K, Simpson M, Wahlert G, Waselkov K, Williams K, Wilson P (2020) THE CALIFORNIA PHENOLOGY COLLECTIONS NETWORK: USING DIGITAL IMAGES TO INVESTIGATE PHENOLOGICAL CHANGE IN A BIODIVERSITY HOTSPOT. Madroño 66 (4): 130 -141 . https://doi.org/10.3120/0024-9637-66.4.130