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DATA PAPER

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Co-mast: Harmonized seed production data for woody plants across US long-term research sites

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Abstract

Plants display a range of temporal patterns of inter-annual reproduction, from relatively constant seed production to "mast seeding," the synchronized and highly variable interannual seed production of plants within a population. Previous efforts have compiled global records of seed production in long-lived plants to gain insight into seed production, forest and animal population dynamics, and the effects of global change on masting. Existing datasets focus on seed production dynamics at the population scale but are limited in their ability to examine community-level mast seeding dynamics across different plant species at the continental scale. We harmonized decades of plant reproduction data for 141 woody plant species across nine Long-Term Ecological Research (LTER) or long-term ecological monitoring sites from a wide range of habitats across the United States. Plant reproduction data are reported annually between 1957 and 2021 and based on either seed traps or seed and/or cone counts on individual trees. A wide range of woody plant species including trees, shrubs, and lianas are represented within sites allowing for direct community-level comparisons among species. We share code for filtering of data that enables the comparison of plot and individual tree data across sites. For each species, we compiled relevant life history attributes (e.g., seed mass, dispersal syndrome, seed longevity, sexual system) that may serve as important

Roman I. Zlotin, deceased 26 February 2023.

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predictors of mast seeding in future analyses. To aid in phylogenetically informed analyses, we also share a phylogeny and phylogenetic distance matrix for all species in the dataset. These data can be used to investigate continent-scale ecological properties of seed production, including individual and population variability, synchrony within and across species, and how these properties of seed production vary in relation to plant species traits and environmental conditions. In addition, these data can be used to assess how annual variability in seed production is associated with climate conditions and how that varies across populations, species, and regions. The dataset is released under a CC0 1.0 Universal public domain license.

KEYWORDS
community dynamics, long-term data, LTER, mast fruiting, mast seeding, masting, plant reproduction, plant traits, synchronous reproduction, USA

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DATA AVAILABILITY STATEMENT

The dataset is available as Supporting Information and in Dryad at https://doi.org/10.5061/dryad.69p8cz98q. Code is available in Zenodo at https://doi.org/10.5281/zenodo.10582903.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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