Metadata for the cleaned compiled Inouye Gothic (Colorado, USA) long-term flowering dataset

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Preface

This document describes the features of David Inouye's long-term flowering dataset from Gothic, Colorado, USA. This dataset was compiled from original Excel worksheets by Elizabeth M. Wolkovich with help from Jim Regetz, while Jane E. Ogilvie, Amy M. Iler, and Elizabeth M. Wolkovich processed and cleaned the recompiled dataset and added data from 2010 onwards. Metadata for the original Wolkovich and Regetz compilation process are found in the document, "Metadata for compilation of David Inouye's Gothic (Colorado, USA) long-term flowering data".

Project description

David Inouye has been collecting data on the abundance and timing of flowers of flowering plants that fall within fixed plots at the Rocky Mountain Biological Laboratory (RMBL), in Gothic, Colorado, USA, from 1973 to present. During the growing season, flowers of each species are counted approximately every other day, though in some years the start and/or end of flowering were missed, and data were not collected in 1978 and 1990. A core set of 23 2 x 2 m plots have been followed 1974-present (excluding 1978 and 1990), and additional plots have been added through the years, two in 1985 (GH1-2), three in 1998 (GH3-5), and two in 2004 (MDW, STR). Data are now collected in a total of 30 plots. Up to 135 plant species have been recorded in the plots, and flowering grasses and some sedges have been included in the data collection since 2010. The floral unit counted for each species and further data collection details are described in a separate metadata file.

Dataset description

1. Each row is a flower count for a particular species, plot, and day of year within the growing season (flower count is summed within a plot for a plant species). Typically zeros are not included in the dataset; because all flowers are counted in a plot on each sampling day, an absence of a species on a date should be considered a zero. An "NA" indicates that a plant species was blooming but its flowers were not counted, or it was raining/cloudy on that day so flowers were not sampled or were closed. Day of year ("doy") begins with January 1 as 1.

2. Plant species names follow: Weber WA and Wittmann RC (2012) Colorado flora: western slope. University Press of Colorado, Boulder.

3. Plots names are descriptive: Aspen Forest (AF8-9), Erythronium Meadow (EM1-2), Green House (GH1-5), Meadow (MDW), Willow-Wet Meadow Interface (INT1-5), Rocky Meadow (RM1-7), Stream (STR), Veratrum Removal (VR1-2), and Wet Meadow (WM1-5).

4. On some dates, it was known that a particular plant species was blooming in a plot, but the flowers were not counted. These are indicated by "NA" in the dataset (they are missing data). *Salix* spp. were often recorded in this way. In some cases, a coarser level of flowering

was recorded instead of the typical floral count, e.g., the number of plants instead of the number of flowers. This would be indicated by a "NA" in the typical floral count unit column. *[JEO, March 2016: Only the floral unit with the maximum flower number is included in this preliminary dataset.]*

5. In some years, the earliest and/or latest flowering was missed, or there was a break in sampling. These are the details:

Year	Start DOY	Census notes
1974	145	Onset missed in *Claytonia lanceolata*, *Mertensia fusiformis*, *Androsace septentrionalis*, & *Noccaea montana*
1975	154	Onset missed in *Claytonia lanceolata* (missed peak in RM7, first plot to flower)
1976	157	Onset was missed in several species; no data from 5 July to 5 August in WM, EM, & VR plots
1977	156	Onset was missed in several species
1979	146	Onset was missed in *Claytonia lanceolata*
1982	152	Onset was missed in *Claytonia lanceolata* and *Mertensia fusiformis*
1983	158	Onset was missed in *Claytonia lanceolata*
1985	150	Onset missed in *Claytonia lanceolata*, *Mertensia fusiformis*, *Androsace septentrionalis*, & *Erythronium grandiflorum*
1986	151	Onset missed in *Claytonia lanceolata*, *Mertensia fusiformis*, *Androsace septentrionalis*, *Erythronium grandiflorum*, & *Carex*
1989	133	Onset was missed in *Claytonia lanceolata* and *Mertensia fusiformis*
1991	149	Onset was missed in *Claytonia lanceolata* and *Mertensia fusiformis*
1992	135	David left after day 135 and returned on day 147; also a gap from day 178 to day 183. Thus, parts of various species flowering missed.
1993	153	Onset missed in *Claytonia lanceolata* (missed flowering in RM7, first plot to flower)
1994	155	Onset was missed in several species

6. In some plot-years, the blooming of some species was missed entirely. When such cases were noticed (indicated by a note about the presence of old flowering stalks or developing fruits), its presence in a plot is indicated by a single row in a plot-year with a "1" in a column called "species.missed". *[JEO, March 2016: Not present in this preliminary dataset.]*

7. In some earlier years, the "upper" (RM and AF) and "lower" (EM, GH, INT, VR, WM) plots were counted mostly or sometimes on alternate days. This will affect measurements of total plot counts (such as peak abundance across all plots). Additionally, some plots were sampled more frequently than others (i.e., they were sampled on extra days).

8. Particular species have been added to flowering counts later. This includes grasses and shrubby willows, *Salix* spp., which were added around 2009. In some years, grasses were not identified to species and are referred to as "unkngrass". Some *Carex* spp. are not identified to species and are referred to as "*Carex* sp.".

9. There are two *Lupinus* species that grow within the phenology plots and they have slightly different blooming times. We are working on distinguishing the two species in the dataset, but for now the two species are lumped as *Lupinus* sp.

10. *Cirsium* spp. are not distinguished and are referred to as *Cirsium* sp.