META DATA
WESTERN SYDNEY UNIVERSITY DATA REPOSITORY

Title
Meta-data for Tierney *et al*. (*In Review*) Bee pollination services and the burden of biogeography. *Proc R Soc B* manuscript ID: RSPB-2023-0747.

Description
The spreadsheet entitled 'Animal_Visitation_Survey_Tierney_RSPB_2023.dat' contains data on insect visitation to cultivated apple (cv. Pink Lady, cv. Granny Smith), with associated flower phenology and meteorology (temperature, wind speed, cloud cover).

The spreadsheet entitled 'Floral_Phenology_Survey_Tierney_RSPB_2023.dat' contains data on the number of flower clusters, open flowers for each branch, and the length of the branch in order to calculate the Bloom Index .

Data was collected at orchards in the Blue Mountains and Central West regions of NSW September-October 2017, 2018, 2019; as described in the manuscript Methods section (available online or by request to authors).

These tab-delimited data files [.dat] files contain all the data presented in the related manuscript and the ESM. The Authors are open to collaboration – please contact via email for any proposed downstream use of these data sets.

A description of data variable (column) names for each file is provided below, including an expanded label description and variable measurement level in square brackets.

ANIMAL VISITATION DATA SET

File Name
Animal_Visitation_Survey_Tierney_RSPB_2023.dat

Content
36 variables and 581 cases.

Variables

RefNo	Survey Reference Number: each Animal Visitation survey (row of 15 trees) was given a unique identifier. Each observational quadrat of each tree in each survey row was concatenated to provide a sum value for each animal taxon visiting apple flowers. [Nominal]
Year	Year: the year the survey was undertaken. [Nominal]
Month	Month: the month the survey was undertaken. [Nominal]
Day	Day: the day the survey was undertaken. [Nominal]
Cloud	Cloud Cover: recorded in Oktas from 0 (clear sky) to 8 (fully overcast). [Nominal]
Wind_av	Average Wind Speed: recorded in km/hr. [Scale]
Temp	Ambient Temperature: recorded in degrees Celsius. [Scale]
Crop	Fruit Crop: only one fruit crop is included in this study (1 = Apple). The column is retained as a secondary indicator of data fidelity. [Nominal]

Cultivar	Crop Cultivar: two cultivars are included in this study (1 = cv. Pink Lady; 2 = cv. Granny Smith). [Nominal]
Bloom	Bloom Phase: subjective categorization of flowering phenology of the row being surveyed for insect visitation to crop flowers (1 = king-bloom; 2 = full-bloom). [Nominal]
Region	Study Region: situation of fruit growing region (1 = Blue Mountains; 2 = Central West). [Nominal]
Orchard	Orchard: each orchard was given a unique identifier (1-6 = Blue Mountains; 7-12 = Central West). [Nominal]
Row	Orchard Row: pertains to pre-existing identifiers allocated by growers; hence these numbers may not be unique and should not be used to categorize data above the Orchard-level. [Nominal]
OpenSum	Open Flowers: sum total open flowers from Floral Phenology survey undertaken on the same day as the Animal Visitation survey.
dBI	Index of the Density of the Flowering Bloom: snapshot index of bloom density (*dBI*) on the same day as the Animal Visitation survey. [Scale]
Amegilla	Genus *Amegilla*: sum individuals visiting flowers in survey row. [Scale]
Apis	Genus *Apis*: sum individuals visiting flowers in survey row. [Scale]
Arachnid	Class Arachnida: sum individuals visiting flowers in survey row. [Scale]
Coccinella	Genus *Coccinella*: sum individuals visiting flowers in survey row. [Scale]
Coleoptera	Order Coleoptera (including *Coccinella*): sum individuals visiting flowers in survey row. [Scale]
Colletidae	Family Colletidae: sum individuals visiting flowers in survey row. [Scale]
Diptera	Order Diptera (including Syphidae): sum individuals visiting flowers in survey row. [Scale]
Exoneura	Genus *Exoneura* (including *Brevineura*): sum individuals visiting flowers in survey row. [Scale]
Formicidae	Family Formicidae: sum individuals visiting flowers in survey row. [Scale]
Hemiptera	Order Hemiptera: sum individuals visiting flowers in survey row. [Scale]
Hymenoptera	Order Hymenoptera: sum individuals visiting flowers in survey row. [Scale]
Lasioglossum	Genus *Lasioglossum*: sum individuals visiting flowers in survey row. [Scale]
Lepidoptera	Order Lepidoptera: sum individuals visiting flowers in survey row. [Scale]
Megachilidae	Family Megachilidae: sum individuals visiting flowers in survey row. [Scale]
Odonata	Order Odonata: sum individuals visiting flowers in survey row. [Scale]
Orthoptera	Order Orthoptera: sum individuals visiting flowers in survey row. [Scale]
OthColeoptera	Other Coleoptera - Order Coleoptera (excluding *Coccinella*): sum individuals visiting flowers in survey row. [Scale]
OthDiptera	Other Diptera - Order Diptera (excluding Syphidae): sum individuals visiting flowers in survey row. [Scale]
SyrphidFly	Family Syrphidae: sum individuals visiting flowers in survey row. [Scale]
Tetragonula	Genus *Tetragonula*: sum individuals visiting flowers in survey row. [Scale]
Wasp	Suborder Apocrita (excluding Formicidae & Anthophila): sum individuals visiting flowers in survey row. [Scale]
Xylocopa	Genus *Xylocopa*: sum individuals visiting flowers in survey row. [Scale]

FLOWERING PHENOLOGY DATA SET

File Name
Flowering_Phenology_Survey_Tierney_RSPB_2023.dat

Content
16 variables and 5880 cases.

Variables

RefNo	Survey Reference Number: each Flowering Phenology survey (5 trees in the row of 15 trees survey for animal visitation) was given a unique identifier. [Nominal]
Year	Year: the year the survey was undertaken. [Nominal]
Month	Month: the month the survey was undertaken. [Nominal]
Day	Day: the day the survey was undertaken. [Nominal]
Crop	Fruit Crop: only one fruit crop is included in this study (1 = Apple). The column is retained as a secondary indicator of data fidelity. [Nominal]
Cultivar	Crop Cultivar: two cultivars are included in this study (1 = cv. Pink Lady; 2 = cv. Granny Smith). [Nominal]
Bloom	Bloom Phase: subjective categorization of flowering phenology of the row being surveyed for insect visitation to crop flowers (1 = king-bloom; 2 = full-bloom). [Nominal]
Region	Study Region: situation of fruit growing region (1 = Blue Mountains; 2 = Central West). [Nominal]
Orchard	Orchard: each orchard was given a unique identifier (1-6 = Blue Mountains; 7-12 = Central West). [Nominal]
Row	Orchard Row: pertains to pre-existing identifiers allocated by growers; hence these numbers may not be unique and should not be used to categorize data above the Orchard-level. [Nominal]
Tree	Tree Number: five trees in each row (tree # 3, 6, 9, 12, 15) assessed for blossom development. [Nominal]
Branch	Branch Number: at each tree, four lateral branches were assessed for blossom development. [Nominal]
Length	Branch Length: lateral-branch length from the main tree trunk (cm). [Scale]
Clusters	Flower Clusters: the number of flower clusters per branch. [Scale]
Open	Open Flowers: the number of open flowers per branch. [Scale]
dBI	Index of the Density of the Flowering Bloom: snapshot index of bloom density (*dBI*). [Scale]