# EDI Metadata Template (2019)[[1]](#footnote-1)

Data should be in csv text file. If starting with an Excel spreadsheet, please make sure it does not contain any formulas and comments on cells. If you need comments put them in their own column. If data were used in a database and major table linking is necessary to analyze, please de-normalize into a flat file, not just database table exports.

## Dataset Title

Data and analysis code from: Micro-scale geography of synchrony in a serpentine plant community

## Short name or nickname you use to refer to this dataset:

Jasper Ridge Synchrony

## Abstract

This package includes data and code to reproduce analyses of micro-scale geography of synchrony in the plant community at Jasper Ridge Biological Preserve. Plant cover and soil depth data come from long-term experimental plots established by Richard Hobbs. Plant cover is aggregated into 36 1m2 plots across three treatments (control, gopher exclosure, rabbit exclosure) from 1983 to 2015; included herein are data on the 6 most abundant species (*Plantago erecta*, *Bromus hordeaceous*, *Lasthenia californica*, *Microseris douglasii*, *Vulpia microstachys*, and *Calycadenia multiglandulosa*), total plant cover across all species, and records of gopher disturbance in the plots. The data package also includes time series of monthly precipitation and growing season Palmer’s Drought Severity Index for the same time period. An R Markdown file is included that reproduces all analyses described in the manuscript and reproduces all data figures.

## Investigators

(list in order as for a paper with e-mail addresses, organization and preferably ORCID ID, if you don’t have one, get it, it’s easy and free: <http://orcid.org/>) add table rows as needed

|  |  |  |  |  |  |
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| First Name | Middle Initial | Last Name | Organization | e-mail address | ORCID ID (optional) |
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## Other personnel names and roles

(dataset creators & contact, field crew, data entry etc. with e-mail addresses, organization and ORCID ID)

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| --- | --- | --- | --- | --- | --- | --- |
| First Name | Middle Initial | Last Name | Organization | e-mail address | ORCID ID (optional) | Role in project |
| Rebecca |  | Campbell | University of Western Australia | rebecca.campbell@uwa.edu.au |  | Data entry, QAQC |
| Harold |  | Mooney | Stanford University | hmooney@stanford.edu |  | Project initiation and support |

## License

CCBY

## Keywords

Jasper Ridge Biological Preserve, serpentine grassland, long-term data, vegetation, annual plants, invasion

## Funding of this work:

Add rows to table if several grants were involved, list only the main PI, start with main grant first:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| PI First Name | PI Middle Initial | PI Last Name | PI ORCID ID (optional) | Title of Grant | Funding Agency | Funding Identification Number |
| Richard | J | Hobbs |  |  | UK Natural Environmental Research Council |  |
| Richard | J | Hobbs |  |  | NSF |  |
| Richard | J | Hobbs |  |  | Mellon Foundation |  |
| Richard | J | Hobbs |  |  | CSIRO |  |
| Richard | J | Hobbs |  |  | Murdoch University |  |

## Timeframe

* Begin date: 1983
* End date: 2015
* Data collection ongoing/completed: ongoing

## Geographic location

* Verbal description: Data were collected from 1983-2015 at the Jasper Ridge Biological Preserve in San Mateo County, California, USA. The study site is a serpentine outcrop that bisects the ridge. Typical of serpentine grasslands, the soil is shallow (<40 cm deep), with low nutrient concentrations, high nickel and manganese concentrations and a low calcium:magnesium ratio. The site experiences a Mediterranean climate with mild, wet winters and hot, dry summers. Mean growing season rainfall (September–April) over the study period was 604 mm but varied greatly, from 228–1155 mm. The site is dominated by annual plants (primarily annual forbs and a few annual grasses) that germinate in autumn and set seed in spring and summer.
* North bounding coordinates (decimals): 37.404946
* South bounding coordinates (decimals): 37.404669
* East bounding coordinates (decimals): -122.2237973
* West bounding coordinates (decimals): -122.223963

## Taxonomic species or groups

Plants: *Plantago erecta*, *Bromus hordeaceous*, *Lasthenia californica*, *Microseris douglasii*, *Vulpia microstachys*, *Calycadenia multiglandulosa*

Disturbance agent: *Thomomys bottae*

## Methods

Please note this text is directly from the corresponding publication by Walter, Hallett et al. in review “Micro-scale geography of synchrony in a serpentine plant community”:

In November 1982, Richard J. Hobbs established three permanent experimental treatments at our study site: gopher exclosures, rabbit exclosures and a control. Gopher exclosures were achieved by burying 1 cm mesh to the bedrock, with 30–40 cm of mesh extending aboveground. Rabbit exclosures were created using 2-cm mesh to create a 1 m high fence around the plots. See Hobbs and Mooney (1991) for full experimental details. The gopher plots were re-fenced twice in the first 20 years of study; however, the fencing was only partially successful and all plots were disturbed at some point. As such, the gopher exclosure treatment reduced the frequency of disturbance but did not eliminate disturbance (Hobbs et al. 2007). At the same time, Hobbs et al. (2007) found that the rabbit exclosure treatment experienced elevated amounts of gopher activity; thus, in aggregate the treatments created communities that experienced a broad range of disturbance frequencies.

The experiment was replicated three times in a random-block design. Each replicate treatment was 4 m × 4 m and replicates were separated by 5 m. Data were collected from 24 contiguous 0.5 m × 0.5 m quadrats arranged in two 1 m × 3 m blocks. We averaged the top and bottom four quadrats in each block to yield 36 1 m × 1 m spatially explicit plots.

Species abundance was measured visually as percent cover in early April of each year (nomenclature following Baldwin et al. 2012), using cover classes of 1, 2, 5, 10 and increments of 10 thereafter; total cover could be greater than 100 due to canopy structure or less than 100 due to bare ground. For these analyses we focused on the six species with the highest average abundances over time: four native annual forbs (Calycadenia multiglandulosa, Lasthenia californica, Microseris douglasii, Plantago erecta), a native annual grass (Vulpia microstachys) and a non-native annual grass (Bromus hordeaceus). Presence of new gopher mounds was mapped each April from 1983 to 2015. Gopher activity was scored as presence/absence within each quarter of the quadrats; thus, when averaged at the plot level gopher activity ranged on a scale of 0 (no disturbance) to 4 (all areas were disturbed) in 0.25 increments. In 1983 soil depth was scored in each quarter of quadrats by pushing a graduated metal probe into the soil until it hit bedrock. This resulted in 16 replicate measures of soil depth which we averaged for each 1 m × 1 m plot.

*Citations*

Baldwin, Bruce G., Douglas H. Goldman, David J. Keil, Robert Patterson, Thomas J. Rosatti, and Dieter H. Wilken, eds. *The Jepson Manual: Vascular Plants of California*. Second Edition, Thoroughly Revised and Expanded edition. Berkeley, Calif: University of California Press, 2012.

Hobbs, Richard J., and Harold A. Mooney. “Effects of Rainfall Variability and Gopher Disturbance on Serpentine Annual Grassland Dynamics.” *Ecology* 72, no. 1 (February 1991): 59–68. <https://doi.org/10.2307/1938902>.

Hobbs, Richard J., Susan Yates, and Harold A. Mooney. “Long-Term Data Reveal Complex Dynamics in Grassland in Relation to Climate and Disturbance.” *Ecological Monographs* 77, no. 4 (2007): 545–568.

## Data Table

* Column name: exactly as it appears in the dataset. Please avoid special characters, dashes and spaces.
* Description: please be specific, it can be lengthy
* Unit: please avoid special characters and describe units in this pattern: e.g. microSiemenPerCentimeter, microgramsPerLiter, absoptionPerMolePerCentimeter
* Code explanation: if you use codes in your column, please explain in this way: e.g. LR=Little Rock Lake, A=Sample suspect, J=Nonstandard routine followed
* Data format: please tell us exactly how the date and time is formatted: e.g. mm/dd/yyyy hh:mm:ss plus the time zone and whether or not daylight savings was observed.
* If a code for ‘no data’ is used, please specify: e.g. -99999

Please add rows as needed

**Table description:** Add a description for each table

The tables plantago.csv, bromus.csv, lasthenia.csv, microseris.csv, vulpia.csv, calycadenia.csv, and all\_plants.csv are identically formatted, as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| Column name | Description | Unit or  code explanation or date format | Empty value code |
| ID | Plot unique identifier | Follows the format treatment\_replicate\_block\_plot, where treatment ranges from c for control, r for rabbit exclosure, and g for gopher exclosure, replicates ranges from 1 to 3, block from 1 to 2, and plot as either top or bottom |  |
| c1983 | Cover in 1983 | % cover |  |
| c1984 | Cover in 1984 | % cover |  |
| … |  |  |  |
| c2015 | Cover in 2015 | % cover |  |

The table gophers.csv is formatted similarly to the plant cover tables:

|  |  |  |  |
| --- | --- | --- | --- |
| Column name | Description | Unit or  code explanation or date format | Empty value code |
| ID | Plot unique identifier | Follows the format treatment\_replicate\_block\_plot, where treatment ranges from c for control, r for rabbit exclosure, and g for gopher exclosure, replicates ranges from 1 to 3, block from 1 to 2, and plot as either top or bottom |  |
| c1983 | Disturbance index in 1983 | Average disturbance in that plot and year, where 0 signifies no disturbance and 4 signifies that every quarter of the four 0.5 m x 0.5 m quadrats constituting the plot were disturbed |  |
| c1984 | Disturbance index 1984 | Average disturbance in that plot and year, where 0 signifies no disturbance and 4 signifies that every quarter of the four 0.5 m x 0.5 m quadrats constituting the plot were disturbed |  |
| … |  |  |  |
| c2015 | Disturbance index in 2015 | Average disturbance in that plot and year, where 0 signifies no disturbance and 4 signifies that every quarter of the four 0.5 m x 0.5 m quadrats constituting the plot were disturbed |  |

The table plot\_coords.csv:

|  |  |  |  |
| --- | --- | --- | --- |
| Column name | Description | Unit or  code explanation or date format | Empty value code |
| ID | Plot unique identifier | Follows the format treatment\_replicate\_block\_plot, where treatment ranges from c for control, r for rabbit exclosure, and g for gopher exclosure, replicates ranges from 1 to 3, block from 1 to 2, and plot as either top or bottom |  |
| coordX | X coordinate of plot center | Meters from origin |  |
| coordY | Y coordinate of plot center | Meters from origin |  |

The table soil\_depth.csv:

|  |  |  |  |
| --- | --- | --- | --- |
| Column name | Description | Unit or  code explanation or date format | Empty value code |
| treatment | Treatment identifying code | ‘c’ = control, ‘r’ = rabbit exclosure, ‘g’ = gopher exclosure |  |
| trtrep | Replicate identifying code | Takes values 1 through 3 |  |
| plot | Plot identifying code | Combines the block (either 1 to 2), and plot (either top or bottom) |  |
| soilDepth | Mean soil depth in the plot | cm |  |
| minSoilDepth | Min soil depth in the plot | cm |  |
| maxSoilDepth | Max soil depth in the plot | cm |  |

The table pdsi.csv:

|  |  |  |  |
| --- | --- | --- | --- |
| Column name | Description | Unit or  code explanation or date format | Empty value code |
| samplingYear | Year of sampling |  |  |
| season | season | All entries are ‘g’ for growing season |  |
| PDSI | Palmer’s drought severity index | A standardized index from -10 (dry) to 10 (wet) |  |
| PHDI | Palmer’s hydrologic drought index | A standardized index from -10 (dry) to 10 (wet) |  |

The table precip\_monthly.csv:

|  |  |  |  |
| --- | --- | --- | --- |
| Column name | Description | Unit or  code explanation or date format | Empty value code |
| month | Month | Numeric, from 1 (January) to 12 (December) |  |
| samplingYear | Year of sampling |  |  |
| allprecip | Total precipitation within the month and year, collected at Jasper Ridge, with gaps filled in by the nearby Woodside Fire Station | mm |  |
| growseason | Indicates whether the month was part of the growing season | ‘g’ for growing season, otherwise, ‘s’ for summer |  |
| growseasonnoApr | Indicates whether the month was part of the growing season, excluding April from the growing season (as sampling typically occurred the first two weeks of April) | ‘g’ for growing season, otherwise, ‘s’ for summer |  |

## Articles

(List articles citing this dataset)

|  |  |  |
| --- | --- | --- |
| Article DOI or URL (DOI is preferred) | Article title | Journal title |
| To be populated following acceptance | Micro-scale geography of synchrony in a serpentine plant community | Journal of Ecology (in review) |
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## Scripts/code (software)

(List any software scripts/code you would like to archive along with your data. These may include processing scripts you wrote to create, clean, or analyze the data.)

|  |  |  |
| --- | --- | --- |
| File name | Description | Scripting language |
| JRSynchrony\_Master.Rmd | Reproduces all analyses and figures in the manuscript. | R |
| plotClusterMap\_JRG.R | Custom plotting helper function | R |

## Data provenance

(Were these data derived from other data? If so, you will want to document this information so users know where these data come from.)

|  |  |  |  |
| --- | --- | --- | --- |
| Dataset title | Dataset DOI or URL | Creator (name & email) | Contact (name & email) |
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## Notes and Comments

1. This document liberally borrows from similar documents at SBC and GCE [↑](#footnote-ref-1)