Using BART with a virtual species!

Getting Started

So you're interested in using `embarcadero` to do species distribution modeling with Bayesian additive regression trees! That's great. BARTs are a powerful way to do machine learning and, while not a new method per se, they are very new for SDMs.

Most of the core functionality of `embarcadero` is actually a wrapper for `dbarts`, which runs the actual BART fitting process. This vignete will show you

1. How to run BARTs
2. Variable importance measures
3. Automated variable selection
4. Partial dependence plots
5. Visualizing the posterior distribution

There's also just going to be some general comments on the process of using BARTs, the challenges to working with them, and some things that are hopefully coming next.

```
#> Loading required package: raster
#> Loading required package: sp
#>
#> Attaching package: 'raster'
#> The following object is masked from 'package:dplyr':
#>
#>     select
#> The following object is masked from 'package:tidyr':
#>
#>     extract
#> Loading required package: dbarts
#>
#> Attaching package: 'dbarts'
#> The following object is masked from 'package:raster':
#>
#>     extract
#> The following object is masked from 'package:tidyr':
#>
#>     extract
#> Loading required package: Metrics
#> Loading required package: dismo
#> Loading required package: ROCR
#> Loading required package: gplots
#>
#> Attaching package: 'gplots'
#> The following object is masked from 'package:stats':
#>
#>     lowess
#> Loading required package: patchwork
#>
#> Attaching package: 'patchwork'
#> The following object is masked from 'package:raster':
#>
```

```
#>     area
#> Loading required package: cowplot
#>
#> Attaching package: 'cowplot'
#> The following object is masked from 'package:patchwork':
#>
#>     align_plots
#> The following object is masked from 'package:ggplot2':
#>
#>     ggsave
#> Loading required package: velox
#> Loading required package: ggpubr
#> Loading required package: magrittr
#>
#> Attaching package: 'magrittr'
#> The following object is masked from 'package:dbarts':
#>
#>     extract
#> The following object is masked from 'package:raster':
#>
#>     extract
#> The following object is masked from 'package:purrr':
#>
#>     set_names
#> The following object is masked from 'package:tidyr':
#>
#>     extract
#>
#> Attaching package: 'ggpubr'
#> The following object is masked from 'package:cowplot':
#>
#>     get_legend
#> The following object is masked from 'package:raster':
#>
#>     rotate
#> Loading required package: matrixStats
#>
#> Attaching package: 'matrixStats'
#> The following object is masked from 'package:dplyr':
#>
#>     count
#> Loading required package: data.table
#>
#> Attaching package: 'data.table'
#> The following object is masked from 'package:raster':
#>
#>     shift
#> The following objects are masked from 'package:dplyr':
#>
#>     between, first, last
#> The following object is masked from 'package:purrr':
#>
#>     transpose
#>
```

```
#> Attaching package: 'embarcadero'
#> The following object is masked from 'package:purrr':
#>
#>     partial
```

Doors are closing; please stand clear of the doors.

Mapping Hyalomma