LDATS diagnostics/results exploration

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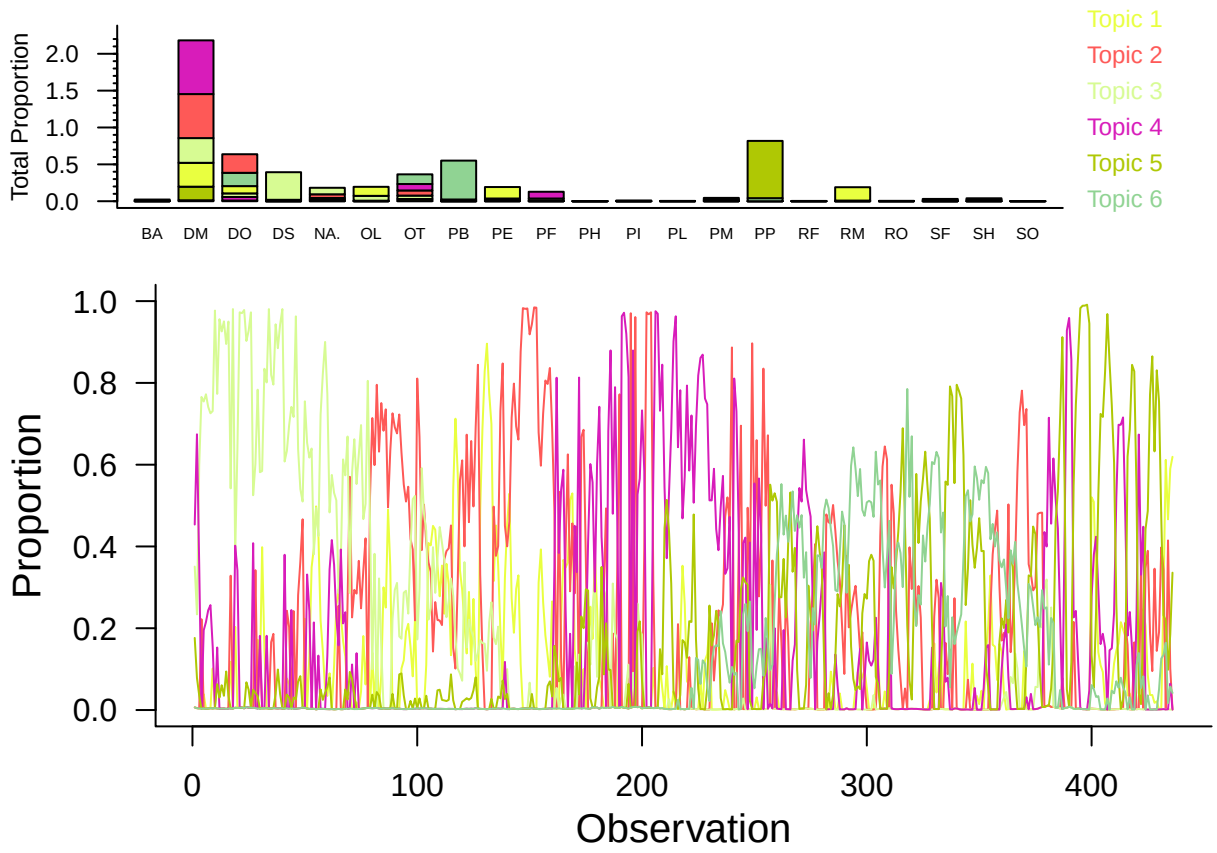
Paper data

```
load('diagnostics_526.Rdata')
```

Plot the LDA...



Six topics seems like a lot!

Changepoint results:

```
summarize_cps(cps = changepoint$cps, prob = 0.95)
```

```
##                   Mean  Median    Lower    Upper    SD MCMCerr    AC10
## Changepoint_1 1989.76 1991.54 1987.537 1996.537 35.99  0.3617 -0.0006
## Changepoint_2 2000.26 1999.54 1997.537 2011.537  3.78  0.0380  0.5407
##                     ESS
## Changepoint_1 7851.4815
## Changepoint_2  222.5404
```

Changepoint diagnostics (not sure how to interpret these?)

```
changepoint$MCMCdiagnostics
```

```
## $acceptance_rates
## [1] 0.1282828 0.5688889 0.8027273 0.9552525 0.9777778 0.9821212
##
## $swapping_rates
## [1] 0.07020202 0.36878788 0.49909091 0.91262626 0.97111111
##
## $trip_counts
## [1] 8 7 9 7 8 0
##
## $trip_rates
## [1] 0.0008080808 0.0007070707 0.0009090909 0.0007070707 0.0008080808
## [6] 0.0000000000
```

Overall, it gets six topics and two changepoints, one in approximately 1989 and one in 2000 (both with large intervals). These line up with two of the changepoints from the paper.

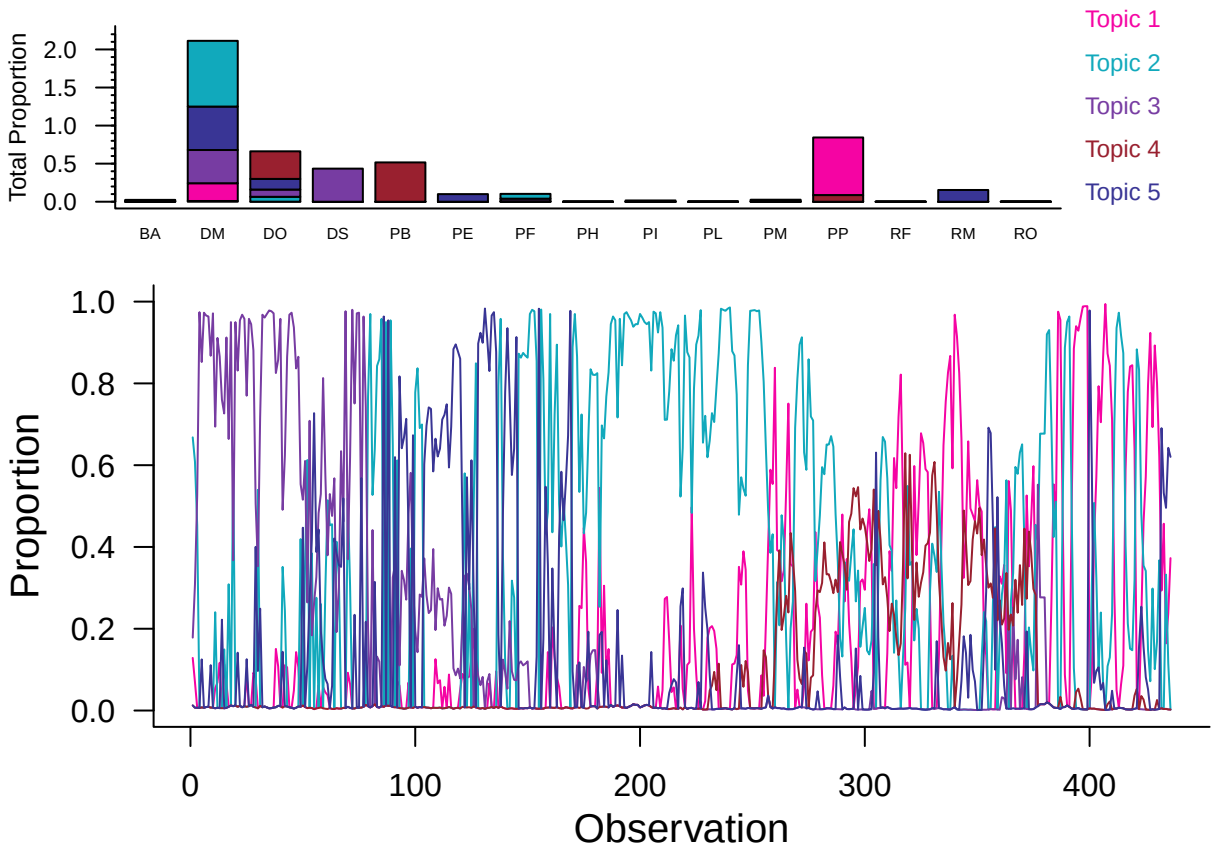
I'm curious about the big differences between this analysis and what was found in the paper. They're using exactly the same data, but getting different numbers of topics and changepoints.

```
rm(rodent_data, changepoint, selected)
```

Granivores-only, control plots, longer time series

```
load('diagnostics_526_controltimegraniv.Rdata')
```

Plot the LDA:



Changepoint results:

```
summarize_cps(cps = changepoint$cps, prob = 0.95)
```

```
##                   Mean  Median    Lower    Upper    SD MCMCerr   AC10
## Changepoint_1 1989.74 1990.54 1985.537 1993.537 21.90  0.2201 0.0014
## Changepoint_2 2000.12 1999.54 1997.537 2003.537  1.84  0.0185 0.3050
##                      ESS
## Changepoint_1 9900.0000
## Changepoint_2  553.7979
```

Changepoint diagnostics:

```
changepoint$MCMCdiagnostics
```

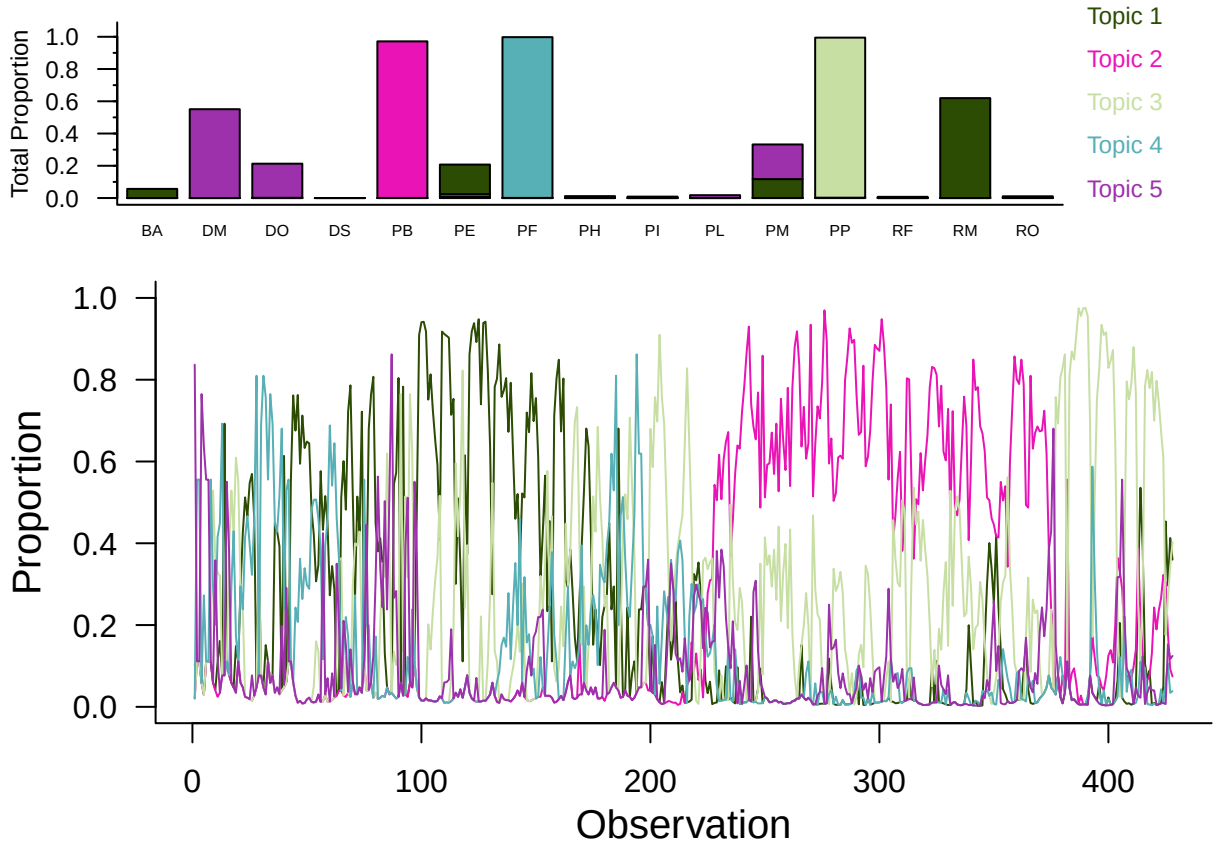
```
## $acceptance_rates
## [1] 0.1051515 0.5712121 0.8418182 0.9569697 0.9740404 0.9801010
##
## $swapping_rates
## [1] 0.08292929 0.30515152 0.59696970 0.93888889 0.97606061
##
## $trip_counts
## [1] 7 5 3 5 2 7
##
## $trip_rates
## [1] 0.0007070707 0.0005050505 0.0003030303 0.0005050505 0.0002020202
## [6] 0.0007070707
```

With only granivores, we get only 5 topics and approximately the same changepoints.

Granivores-only, exclosure plots, longer time series

```
load('diagnostics_time_excl_graniv.Rdata')
```

Plot the LDA:



Changepoint results:

```
summarize_cps(cps = changepoint$cps, prob = 0.95)
```

```
##                   Mean   Median    Lower    Upper    SD MCMCerr   AC10
## Changepoint_1 1993.69 1997.79 1993.789 1998.789 45.15  0.4538 0.0812
## Changepoint_2 2009.63 2009.79 2006.789 2011.789  2.32  0.0233 0.4142
##                      ESS
## Changepoint_1 2641.7154
## Changepoint_2  255.7676
```

Changepoint diagnostics:

```
changepoint$MCMCdiagnostics
```

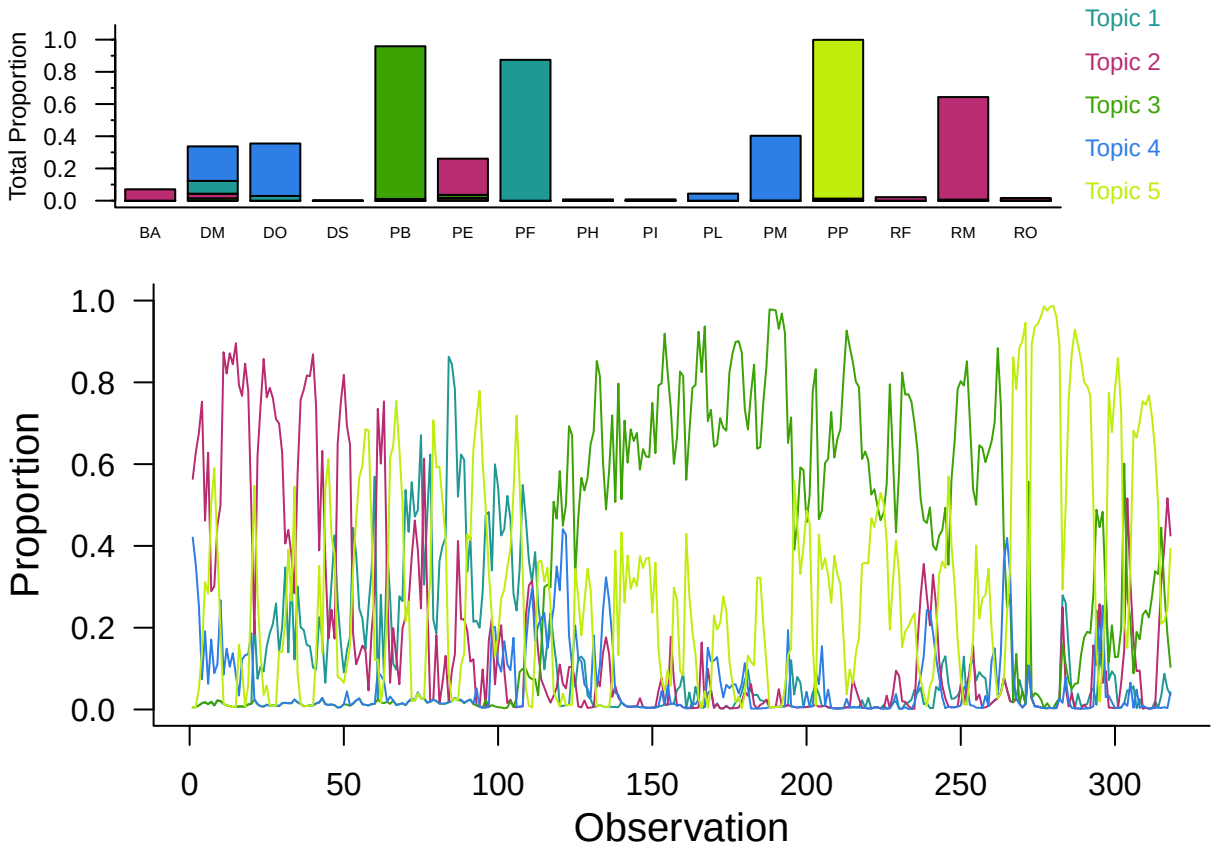
```
## $acceptance_rates
## [1] 0.08141414 0.56212121 0.92333333 0.96383838 0.97535354 0.97797980
##
## $swapping_rates
## [1] 0.09828283 0.22696970 0.87050505 0.97414141 0.98676768
##
## $trip_counts
## [1] 14 12 14 21  8  8
```

```
##
## $trip_rates
## [1] 0.0014141414 0.0012121212 0.0014141414 0.0021212121 0.0008080808
## [6] 0.0008080808
```

Granivores-only, exclosure plots, more plots and shorter time series

```
load('diagnostics_plots_excl_graniv.Rdata')
```

Plot the LDA:



Changepoint results:

```
summarize_cps(cps = changepoint$cps, prob = 0.95)
```

```
##                   Mean   Median    Lower    Upper     SD MCMCerr   AC10
## Changepoint_1 1948.74 1997.06 1537.059 2001.059 162.73  1.6355 0.6769
## Changepoint_2 2007.85 2010.06 1997.059 2011.059   5.90  0.0593 0.5637
##                     ESS
## Changepoint_1 40.30911
## Changepoint_2 83.41097
```

Changepoint diagnostics:

```
changepoint$MCMCdiagnostics
```

```
## $acceptance_rates
## [1] 0.1489899 0.7579798 0.9492929 0.9693939 0.9772727 0.9789899
##
```

```
## $swapping_rates
## [1] 0.07707071 0.51858586 0.92979798 0.98272727 0.99292929
##
## $trip_counts
## [1]  9 13 38 29 17 16
##
## $trip_rates
## [1] 0.0009090909 0.0013131313 0.0038383838 0.0029292929 0.0017171717
## [6] 0.0016161616
```