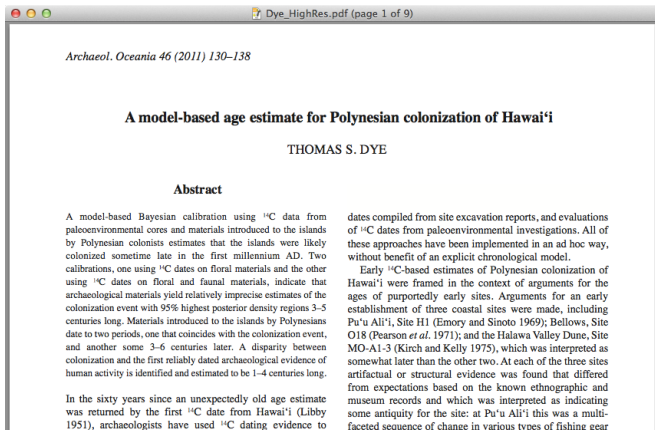


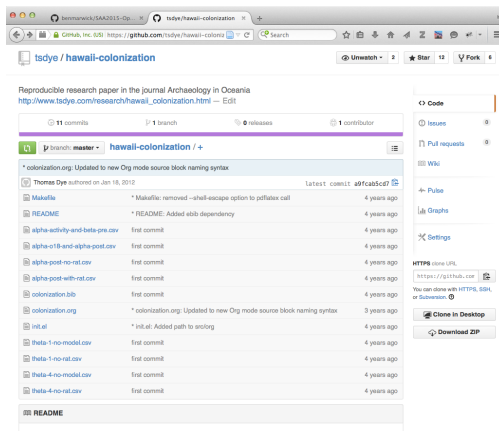
Compendia and Collaboration

Thomas S. Dye
University of Hawai'i at Mānoa

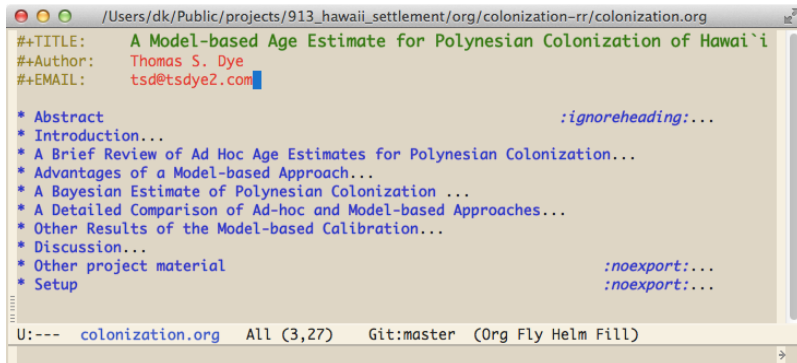
Advertising the Reproducible Research Project¹



A Public Repository for the Project Compendium²



Org Mode: A Tool for Reproducible Research³

A screenshot of a text editor window showing an Org Mode file. The window title is "/Users/dk/Public/projects/913_hawaii_settlement/org/colonization-rr/colonization.org". The file content includes a header with title, author, and email, followed by a table of contents with blue links. The status bar at the bottom shows "U:--- colonization.org All (3,27) Git:master (Org Fly Helm Fill)".

```
/Users/dk/Public/projects/913_hawaii_settlement/org/colonization-rr/colonization.org

#+TITLE:      A Model-based Age Estimate for Polynesian Colonization of Hawai'i
#+Author:     Thomas S. Dye
#+EMAIL:      tsd@tsdye2.com

* Abstract                                           :ignoreheading:...
* Introduction...
* A Brief Review of Ad Hoc Age Estimates for Polynesian Colonization...
* Advantages of a Model-based Approach...
* A Bayesian Estimate of Polynesian Colonization ...
* A Detailed Comparison of Ad-hoc and Model-based Approaches...
* Other Results of the Model-based Calibration...
* Discussion...
* Other project material                           :noexport:...
* Setup                                             :noexport:...

U:---  colonization.org  All (3,27)  Git:master  (Org Fly Helm Fill)
```

Org Mode: Source Code for Figure 1

```
*** Plot Events
:PROPERTIES:...
#name: dated-events-plot
#header: :var bcal=fig-1
#header: :file blank.pdf
#header: :var base.font = 11
#header: :var xlabel = "Calendar Year AD"
#header: :var ylabel = "Probability"
#header: :var theme = "bw"
#header: :width 6 :height 3
#begin_src R :results output_graphics
library(ggplot2)
bcal.df <- data.frame(cal.BP=numeric(0),Posterior.probability=numeric(0),label=character(0))
for (i in seq(dim(bcal)[1]))
{
  t <- read.csv(file=bcal[i,1])
  t <- cbind(t,label=rep(bcal[i,2], dim(t)[1]))
  bcal.df <- rbind(bcal.df,t)
}
switch(theme,
  bw =, BW = theme_set(theme_bw(base_size=base.font)),
  grey =, gray = theme_set(theme_grey(base_size=base.font)),
  theme_set(theme_bw(base_size=base.font)))
g <- ggplot(bcal.df, aes(x=1950 + cal.BP, y=Posterior.probability))
g + geom_bar(stat='identity') + xlab(xlabel) +
  ylab(ylabel) + facet_wrap(~ label)
#end_src

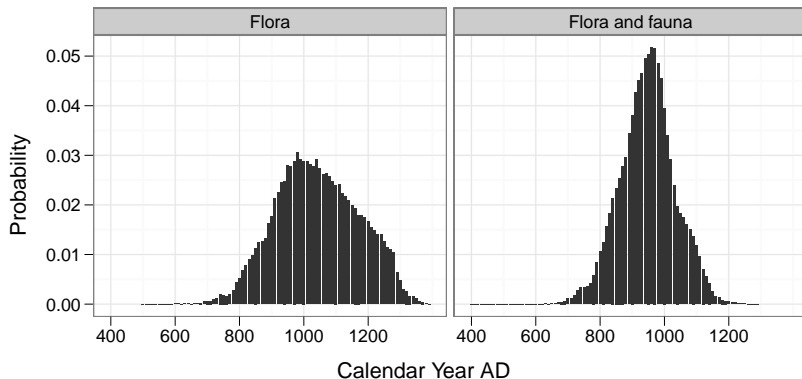
*** Input Tables

These are input tables for the plotting routines. The first column is
the name of a file produced by the BCal software package. The second
column is the annotation that appears at the top of the plot of those
data.

#tblname: fig-1
| alpha-post-no-rat.csv | Flora |
| alpha-post-with-rat.csv | Flora and fauna |

U:--- colonization.org 65% (871,0) Git:master (Org Fly Helm Fill)
```

Figure 1 as it Appears in the Advertisement⁴



Org Mode: Source Code for a Web Page

```
/Users/dk/Public/projects/913_hawaii_settlement/org/colonization-rr/colonization.org
#+TITLE: A Model-based Age Estimate for Polynesian Colonization of Hawai'i
#+Author: Thomas S. Dye
#+EMAIL: tsd@tsdye2.com

* Abstract :ignoreheading:...
* Introduction...
* A Brief Review of Ad Hoc Age Estimates for Polynesian Colonization...
* Advantages of a Model-based Approach...
* A Bayesian Estimate of Polynesian Colonization ...
* A Detailed Comparison of Ad-hoc and Model-based Approaches...
* Other Results of the Model-based Calibration...
* Discussion...
* Other project material :noexport:
This section contains supporting material for the paper, but does not
appear in the pdf output. It contains the graphics routines that
construct the three figures in the paper, some obsolete fancy tables,
references accumulated during the project, some now fairly cryptic
notes that were useful when they were made, and the Org-mode source
for an auxiliary web site that gives instructions how to access the
BCal projects described in the paper.

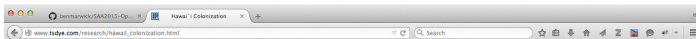
** Graphics...
** Tables...
** References...
** Notes...

Hawai'i Colonization project access instructions
:PROPERTIES:...
This page contains instructions for accessing the Bayesian
calibrations described in "A Model-based Age Estimate for Polynesian
Colonization of Hawai'i" by Thomas S. Dye.

*** Establish Account and Login...
*** Access Calibration Projects...
*** Explore Results...
*** Experiment...
* Setup :noexport:...

U:--- colonization.org All (1595,0) Git:master (Org Fly Helm Fill)
```

Web Page with BCal Project Instructions⁵



Hawai'i Colonization

This page contains instructions for accessing the Bayesian calibrations described in 'A Model-based Age Estimate for Polynesian Colonization of Hawai'i' by Thomas S. Dye.

Table of Contents

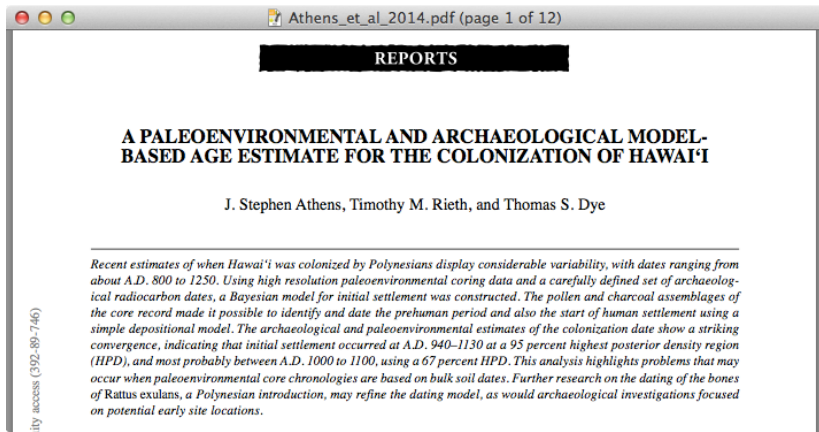
- [1 Establish Account and Login](#)
- [2 Access Calibration Projects](#)
- [3 Explore Results](#)
- [4 Experiment](#)

1 Establish Account and Login

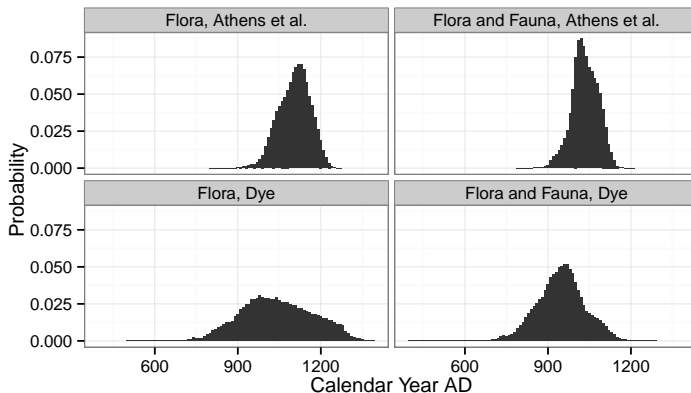
- Send an email message to c.e.buck@sheffield.ac.uk with the subject **Dye Hawai'i Colonization**. If you do not have an account on the BCal server, you can leave the body of the message blank. If you do have an account on the BCal server, and you would like the projects copied to a new subdirectory on that account, then put your BCal User code in the body of the email message.
- You will receive an email reply with a notification that the projects have been copied and, if needed, the information required to login to an account set up for you on the BCal server ([fig. bcal-home](#)).



Advertising the Model-based Collaboration⁶



Model-based Collaboration Yields Results⁷



Take Away: Reproduce!

- Archaeological field investigation is not reproducible
- Archaeological analysis can be reproducible
- A compendium contains the information to reproduce an analysis
- Reproducible model-based analyses foster collaboration
- Collaboration and reproducibility constitute the scientific community

Notes

1. Thomas S. Dye, “A Model-based Age Estimate for Polynesian Colonization of Hawai‘i,” *Archaeology in Oceania* 46 (2011): 130–138, http://www.tsdye.com/public/research/colonization/Dye_HighRes.pdf.
2. Thomas S. Dye, *hawaii-colonization*, Accessed 4/4/15, 2012, <https://github.com/tsdye/hawaii-colonization>.
3. Eric Schulte et al., “A Multi-Language Computing Environment for Literate Programming and Reproducible Research,” *Journal of Statistical Software* 46, no. 3 (January 2012): 1–24, <http://www.jstatsoft.org/v46/i03/paper>.
4. Dye, “A Model-based Age Estimate for Polynesian Colonization of Hawai‘i,” 134.

5. Thomas S. Dye, *Hawai'i Colonization*, Accessed 4/4/15, 2012, http://www.tsdye.com/research/hawaii_colonization.html.

6. J. Stephen Athens, Timothy M. Rieth, and Thomas S. Dye, "A Paleoenvironmental and Archaeological Model-Based Age Estimate for the Colonization of Hawai'i," *American Antiquity* 79, no. 1 (2014): 144–155, http://www.tsdye.com/public/research/am-ant-colonization/Athens_et_al_2014.pdf.

7. Thomas S. Dye, "Dating human dispersal in Remote Oceania: A view from Hawai'i," *World Archaeology* (in press): Figure 4.