Analysis of Environmental Data – Lab 12
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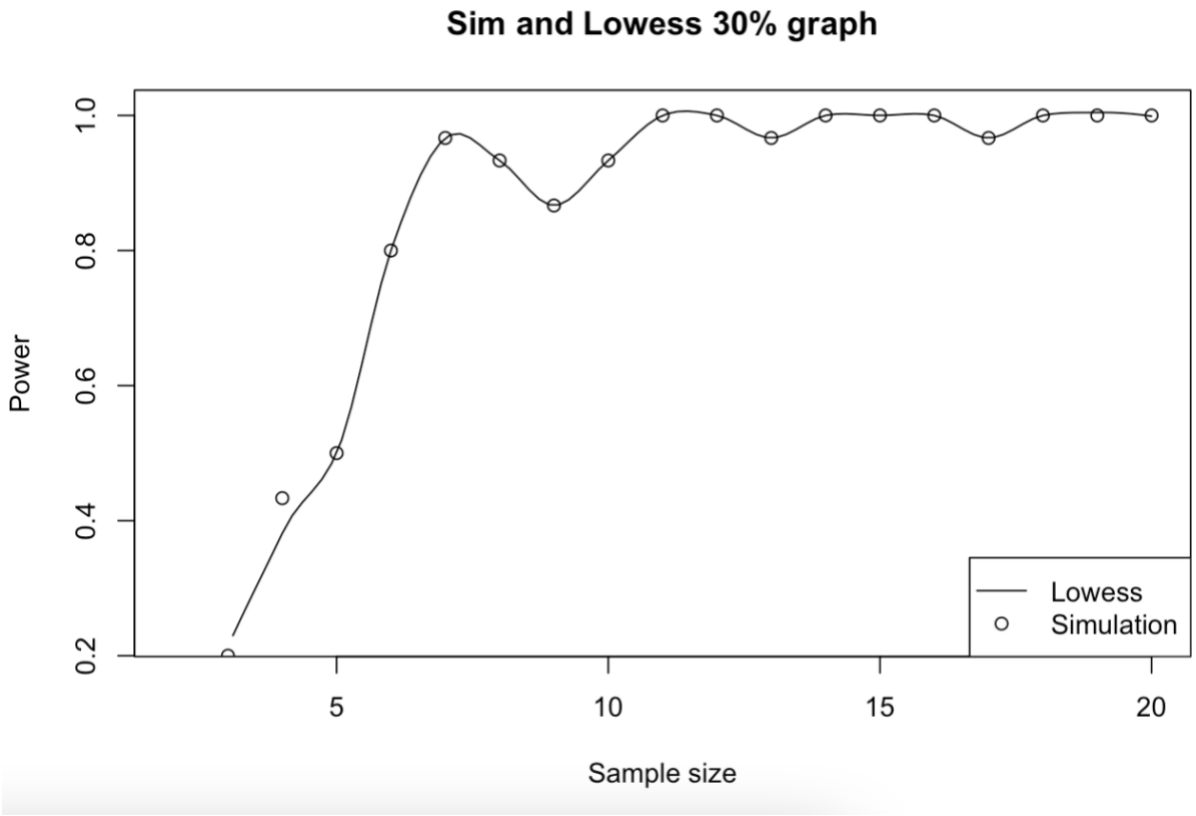
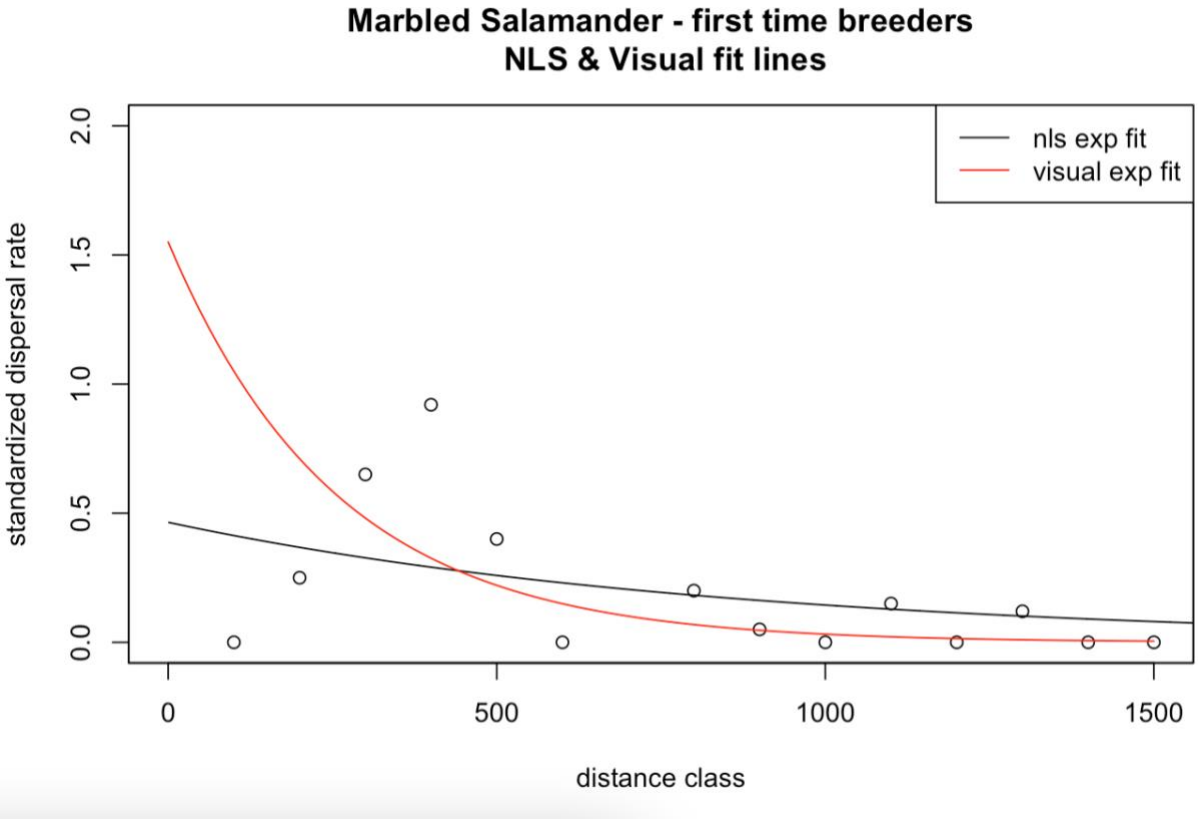
Q1 (2 pts.): Include your plot in your lab report.

```
plot(
  x = newdata_sample_size$sample_size,
  y = predict(fit_lowess_30, newdata = newdata_sample_size), type="l",xlab = 'Sample size',
ylab = 'Power',main="Sim and Lowess 30% graph")
points(
  power ~ sample_size, data = sim_sample_size, type="p", main="Sim and Lowess 30% graph")

legend("bottomright", legend = c("Lowess", "Simulation"), lty = c(1,NA),pch=c(NA, 1), col =
c("black"))
```



Q2 (2 pts.): Include your plot in your lab report.

```
fit_exp_nls = nls(
  disp.rate.ftb ~ exp_fun(dist.class, a, b),
  data = dat_dispersal,
  start = list(b = 0, a = 1))

lines(predict(fit_exp_nls, newdata = dist_newdata))
curve(
  exp_fun(x, 1.55, .0039), add = TRUE, from = 0, to = 1500,
  ann = FALSE, axes = TRUE, ylab = "f(x)", col = "red"); box()
legend("topright", legend = c("nls exp fit", "visual exp fit"), lty = 1, col = c("black", "red"))
```



Q3 (1 pt.): What are the AIC values for each of the 4 models?

fit_GCKI_ba_tot 1369.379

fit_GCKI_slope 1432.615

fit_GCKI_both_additive 1355.951

fit_GCKI_both_interactive 1353.007

Q4 (1 pt.): Which model would you choose, and why?

Model selection based on AICc:

	K	AICc	Delta_AICc	AICcWt	Cum.Wt	LL
fit_GCKI_both_interactive	4	1353.04	0.00	0.81	0.81	-672.50
fit_GCKI_both_additive	3	1355.97	2.93	0.19	1.00	-674.98
fit_GCKI_ba_tot	2	1369.39	16.35	0.00	1.00	-682.69
fit_GCKI_slope	2	1432.63	79.58	0.00	1.00	-714.31

fit_GCKI_both_interactive , since it has the lowest AIC value.

Q5 (1 pt.): Based on the model coefficient table of your chosen model, describe the direction and significance of the relationship(s) of the predictor variable or variables to the binary response. Make sure your answer is in terms of the ecological context.

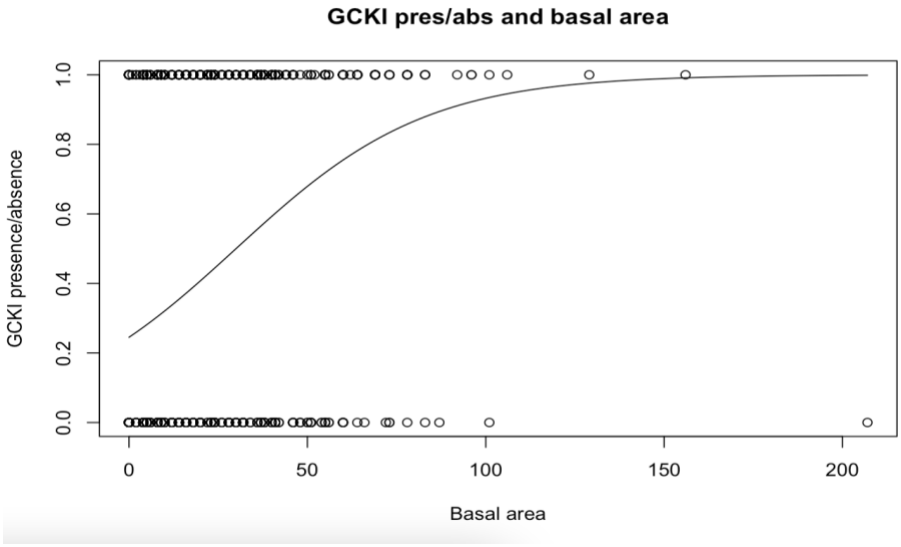
Coefficients:

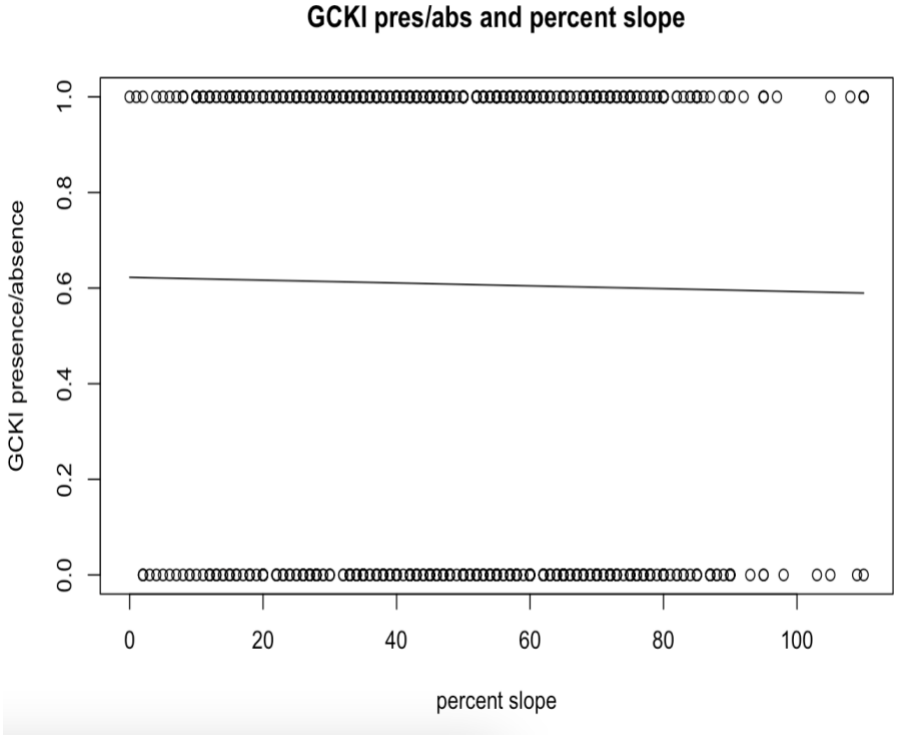
	Estimate	Std. Error	z value	Pr(>|z|)	
(Intercept)	-0.2643673	0.2500615	-1.057	0.2904	
slope	-0.0040863	0.0045338	-0.901	0.3674	
ba.tot	0.0532974	0.0109776	4.855	1.2e-06	***
slope:ba.tot	-0.0004131	0.0001866	-2.214	0.0269	*

Significant codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

This is the best fit because the coefficient table shows that when slope and total basal area are combined into a model and compared with all of the GCKI data, the model has a slightly negative relationship, meaning that this model will represent the GCKI-dataset as a whole when fitting model predictions.

Q6 (2 pts.): Include your two single-predictor model plots in your report





Q7 (4 pts.): Include contour plots (or interactive 3D perspective plots) in your report.