

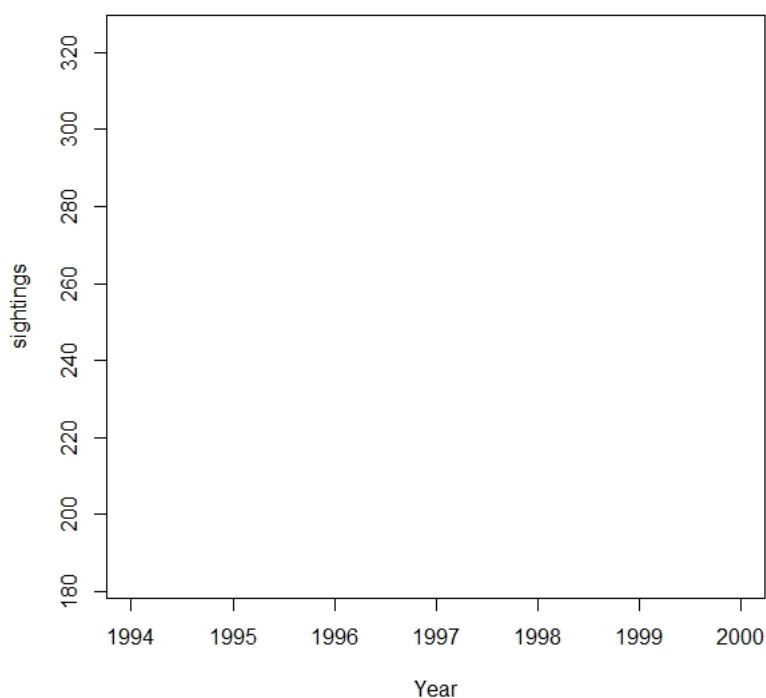
## Regression with beluga data

You will need the R script file “Belugas1\_regression.R”.

An isolated population of about 350 beluga whales lives in Cook Inlet, Alaska, where they are hunted by native Alaskans. Aerial surveys were carried out from 1994 onwards, and regression analysis was used to try to detect a trend in the population. The data and a Bayesian analysis are given by Wade (2001).

Year:	1994	1995	1996	1997	1998	1999	2000
Sightings:	281	324	307	264	193	217	184

Plot the values below. Add a straight line to represent the trend.



### Simple regression

The idea behind regression is that the response variable (the number of belugas) depends on a covariate (time). The relationship is often written as:

$$y = mx + c$$

where  $y$  is the response,  $x$  is the covariate,  $m$  is the slope and  $c$  is the intercept.

### Regression in R

Start R, go to File > Open script... and open the file “Belugas\_regression.R”. Run the commands in the script and add comments to explain what each command is doing.

We will return to this data set later to see how it can be analysed using Bayesian principles and how the Bayesian output can be used in a formal decision-making framework.

**Wade, P R.** 2001. The conservation of exploited species in an uncertain world: novel methods and the failure of traditional techniques. Ch 6 in Reynolds, J, G M Mace, K H Redford, and J G Robinson, editors. *Conservation of exploited species*. Cambridge University Press, Cambridge UK.