Bootstrap Confidence Intervals

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Review of Confidence Intervals

Sampling Distribution

Definition 1 (Sampling Distribution)

- *The sampling distribution of a statistic is the distribution of values taken by the statistic in* ***all possible samples of the same size*** *from the same population.*
- *The standard deviation of a sampling distribution is called a* ***standard error***

Confidence intervals for depths of the ocean

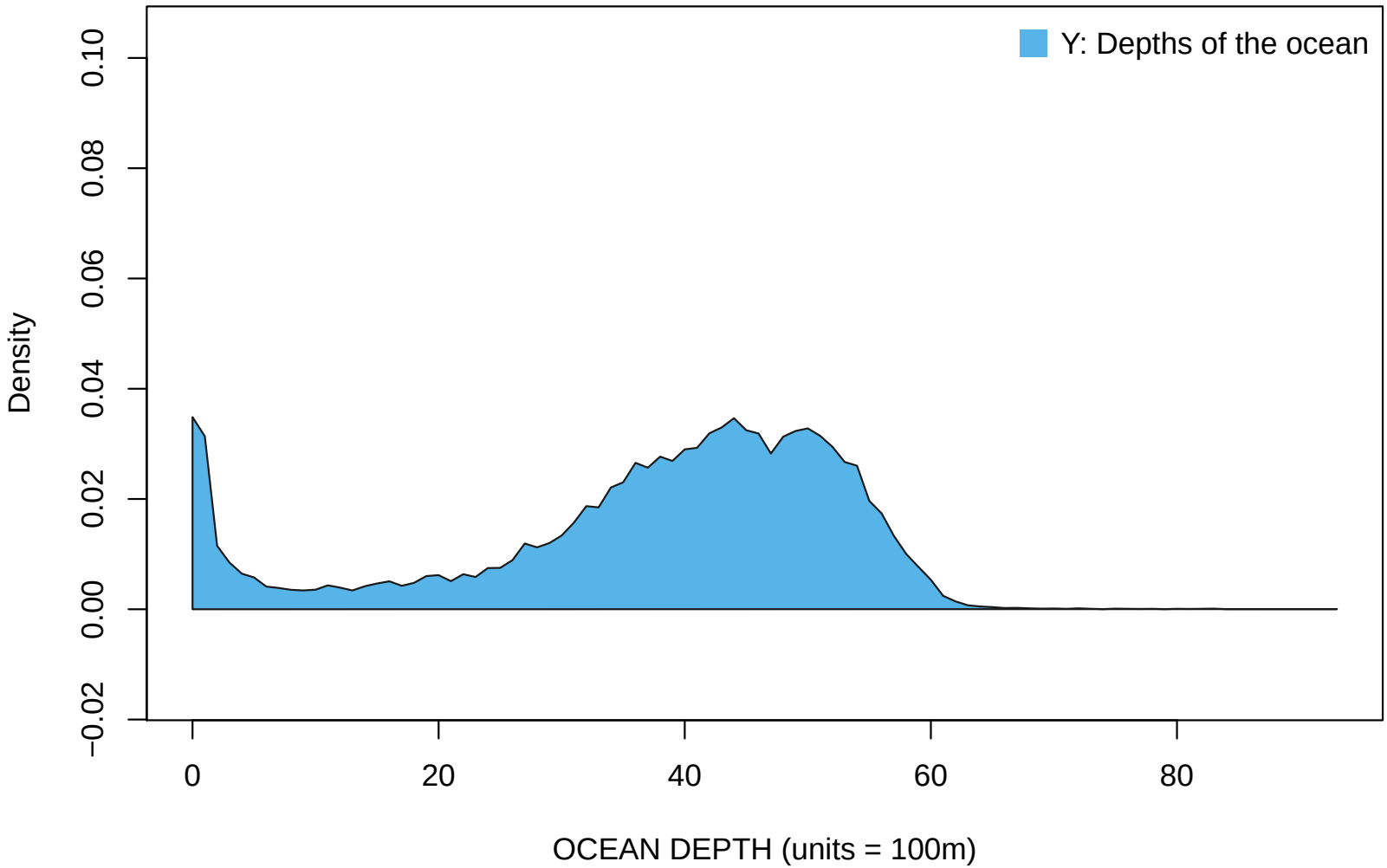

Fig.: The original data distribution of sampled depths of the ocean. Note that it is bimodal and not Normal looking.

The CLT is 'kicking in' at $n = 16$

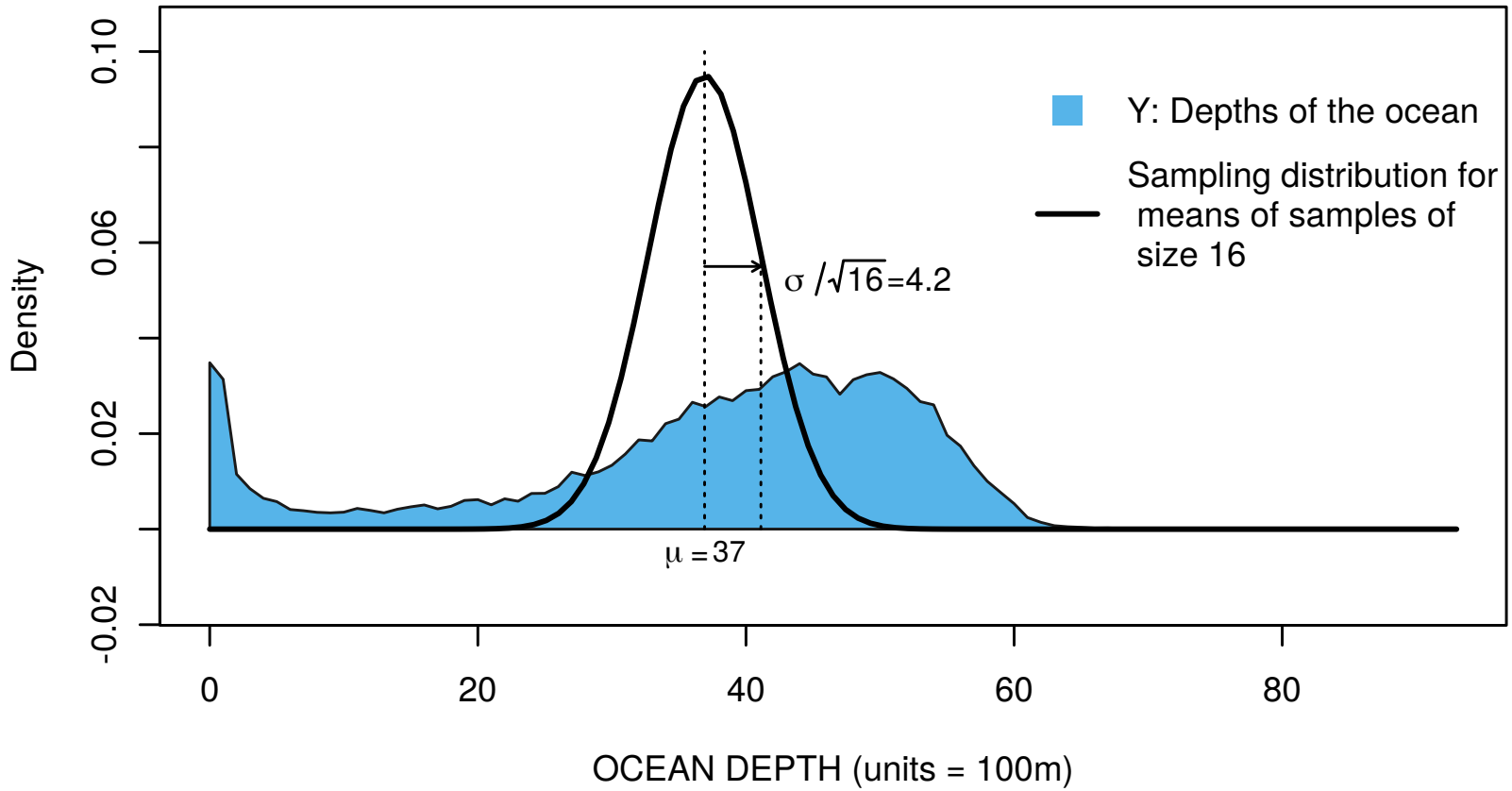

Fig.: The sampling distribution for the mean depth of the ocean with samples of size $n = 16$, looks normal (centered at $\mu = 37$ and SD equal to $\sigma/\sqrt{16}$)

68% Confidence interval using `qnorm`

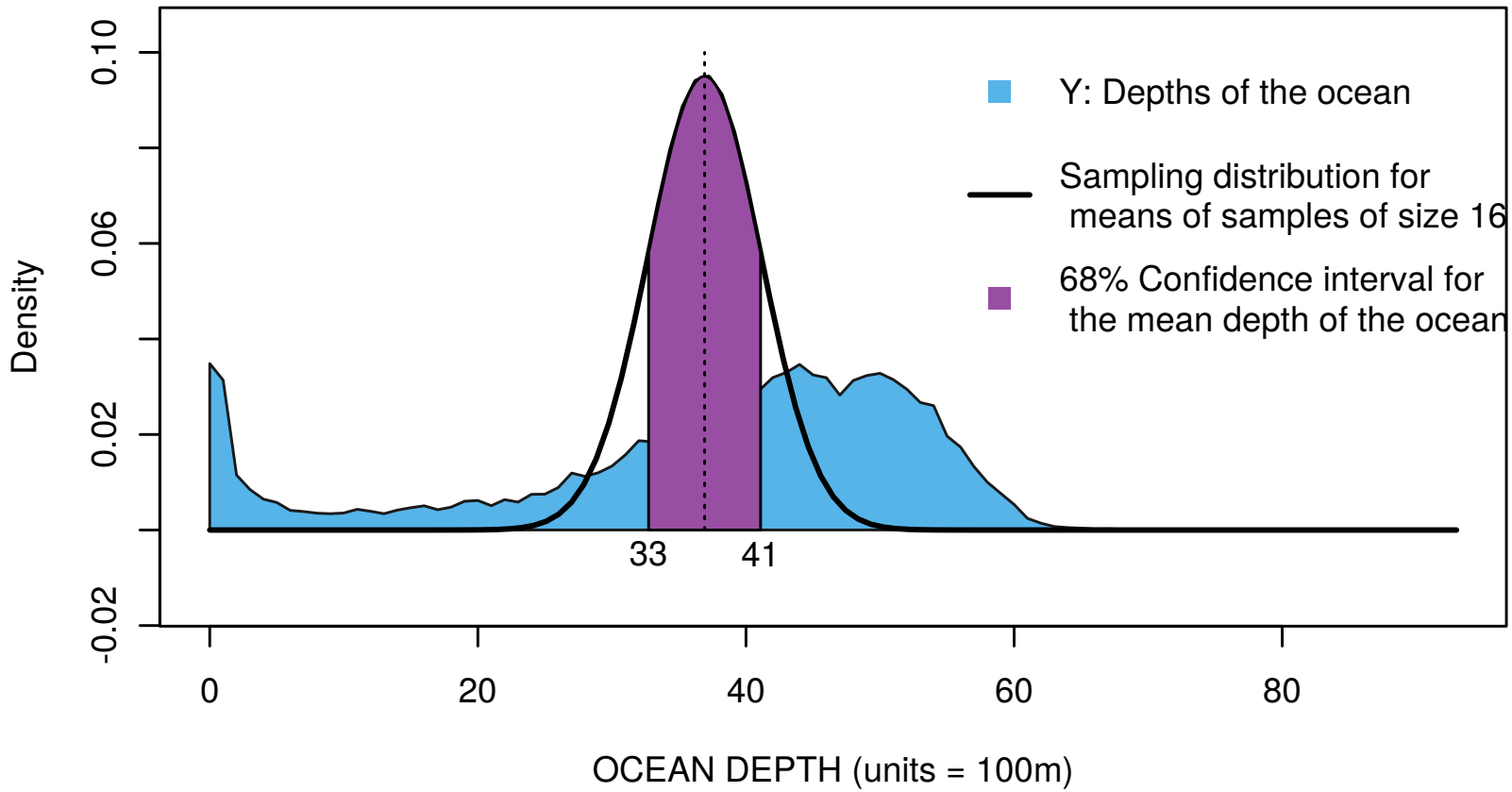

Fig.: 68% Confidence interval calculated using `qnorm(p = c(0.16,0.84), 37, 4.2)`

95% Confidence interval using `qnorm`

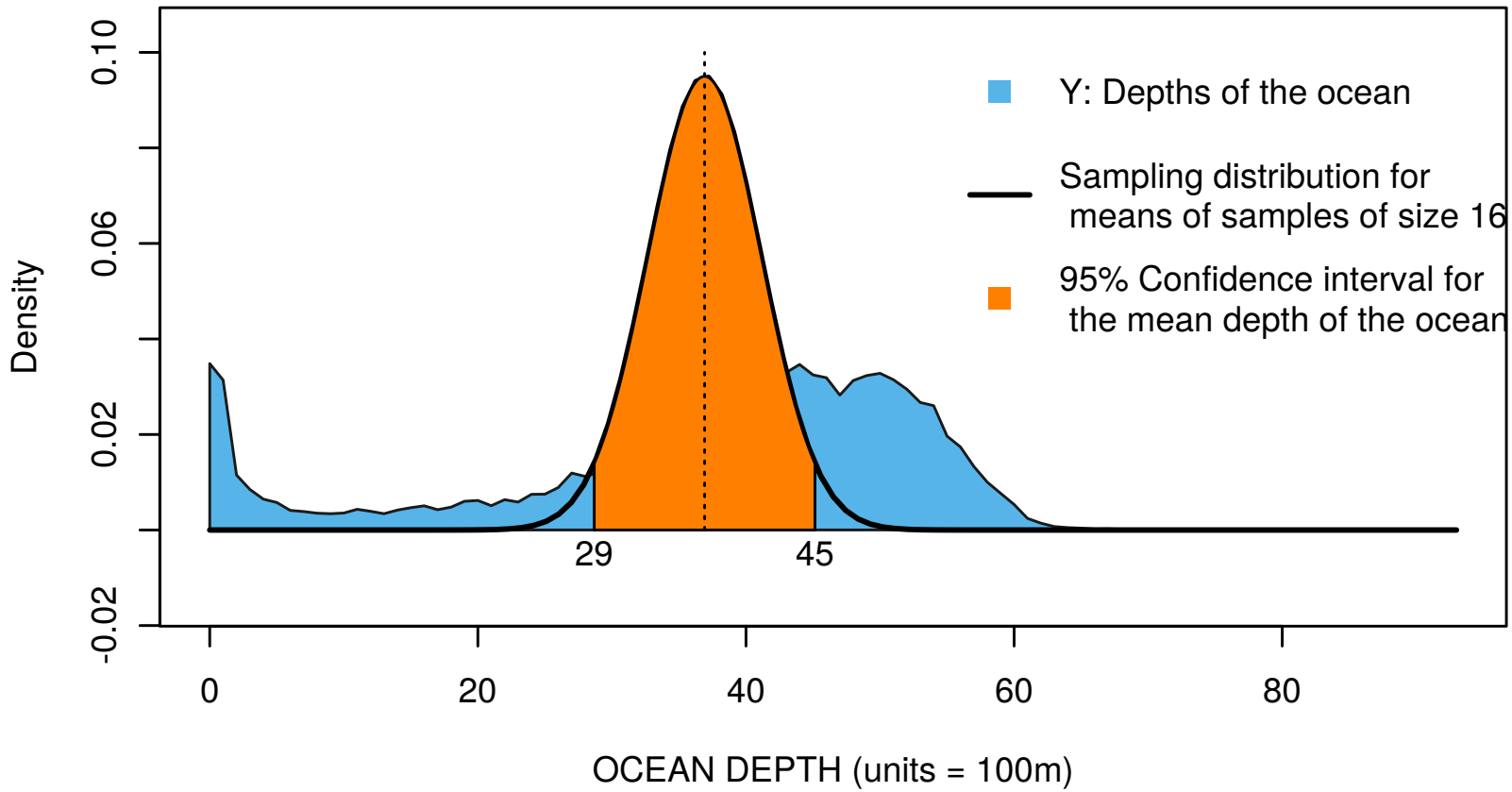

Fig.: 95% Confidence interval calculated using
`qnorm(p = c(0.025,0.975), 37, 4.2)`