On the application of confidence limits to biostratigraphy: an example from diatoms

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For years, diatom-based biostratigraphy has been setting bio-events based on a qualitatively approach. This means that the biostratigraphy would set an age based on the findings or not of a certain species. However, how many species are needed to consider a certain datum as certain? One, ten, 100? Moreover, each biostratigrapher sets its own limits. One might consider one as enough and another 10. Therefore, the scale more often used is the absent, rare, frequent, common, dominant or abundant with an explanation of what these definitions mean. This is very common in, for example, IODP expeditions.

However, what would happen to these biostratigraphy levels if one would apply, for example, a concept of 95% confidence level? Moreover, what would happen to an age model if this concept would be applied to all the biostratigraphy microfossil?

Here we will show Expedition 346 age model differences with and without confidence levels applied to diatoms. The differences can be significant and even considering the existence of a hiatus can be reconsider if confidence limits are applied, turning a possible hiatus into a very slow sedimentation rate having serious implications to the initial paleoceanographic interpretations.