Detecting critical points of regression curves. An application to the management of aquatic living resources

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In many biological studies, it is necessary to estimate the relationship between two specific variables and, in most cases, to determine how this relationship is influenced by one factor it becomes the main problem analysis. Here, we study the length-weight relationship of the barnacle *Pollicipes pollicipes* on the Atlantic coast of Galicia (NW Spain) taking into account the factor year. Growth curves and their derivatives were estimated using local linear kernel smoothers. Confidence intervals were used to draw inference from the derivates curves and testing procedures were applied to asses the true effect of the factor. These inference methods are based on the use of bootstrap techniques. Additionally, a method for the establishment of an ideal minimum size of capture of this species that would ensure a high commercial yield was developed. All computations were performed in *R* using the graphical and inferential tools from the package **NPRegfast**.