

## Generalized Additive Model Approach for the Chilean Hake Population in a Bio-Economic Context

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**Abstract :** The traditional bio-economic method for fisheries modeling uses some estimate of the growth parameters and the system carrying capacity from a biological model for the population dynamics (usually a logistic population growth model) which is then analyzed as a traditional production function. The stock dynamic is transformed into a revenue function and then compared with the extraction costs to estimate the maximum economic yield. In this paper, the logistic population growth model for the population is combined with a forecast of the abundance and location of the stock by using a generalized additive model approach. The paper focuses on the Chilean hake population. This method allows for the incorporation of climatic variables and the interaction with other marine species, which in turn will increase the reliability of the estimates and generate better extraction paths for different conservation objectives, such as the maximum biological yield or the maximum economic yield.

**Keywords :** bio-economic, fisheries, GAM, production

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