Variation of relative abundance and spatial distribution of Jack mackerel (*Trachurus murphyi, Nichols, 1920*) offshore in the South Central of Chile

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Abstract

The Jack mackerel is widely distributed in the southern Pacific Ocean, forming the so-called Jack mackerel belt from Chile to the coasts of New Zealand and Australia. Many studies have been developed around this resource, its biology, distribution and population dynamics. In Chile, surveys have been development offshore using fishing vessels that operates in the fishery of this resource in the central southern of Chile, which have been aimed to the study of jack mackerel in the reproductive season, spring in southern hemisphere since 1997 consecutively through the years. The Jack mackerel is widely distributed in the southern Pacific Ocean, forming the so-called Jack mackerel belt from Chile to the coasts of New Zealand and Australia. Many studies have been developed around this resource, its biology, distribution and population dynamics. In Chile, surveys have been development offshore using fishing vessels that operates in the fishery of this resource in the central southern of Chile, which have been aimed to the study of jack mackerel in the reproductive season, spring in southern hemisphere since 1997 consecutively through the years. The basis information of these surveys were collected by analogous echosounder equipment, in addition to icthyoplankton stations. This work considered the analysis of the time series (2000 - 2014) of spatial indexes, characterization of aggregations in reproductive period and eggs density of jack mackerel. Major indexes were estimated: Coverage (IC), Presence Ecotrazo (IPE), Synthetic area presence of eggs (IA) and concentration (Gini). Additionally, the center of gravity (CG) and inertia (I) was

calculated; The aggregations were characterized according to the level of abundance and depth distribution. Jack mackerel showed inter annual variation in the total analyzed indices. The IC was raised between the years 1997,1999 and 2003 - 2004. The IPE also presented maximum values between 1997, 2004 and 2006. The IA showed the highest values in the period 1998, 2000 - 2001 and 2004. While the CG showed a wide distribution throughout the series, with Western maximum around 500 nm (83 ° W). The Gini index for eggs showed a significant change between 2012 - 2013 due to lower presence of eggs. The indices calculated clearly represent periods of greater and lesser abundance of Jack mackerel and eggs in the series analyzed; showing a negative trend since 2007 in the presence of Jack mackerel and eggs at sea, which does not exceed 1% coverage that represent a constriction area of parental stock, parallel and similarly occurs with spawning area and density of eggs.

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