

RESUMEN

La plataforma interior del Sur de la provincia de Buenos Aires (El Rincón) es un ambiente altamente variable, escasamente conocido y de gran importancia para la región. En la presente investigación se realiza por primera vez un estudio integral del área relacionando la variabilidad climática, las características espacio-temporales de la hidrografía de la plataforma interior y sus implicancias en la vida marina y consecuentemente en la pesca como actividad económica regional.

A partir del análisis de la variabilidad de las precipitaciones, balances hídricos y caudales de los principales ríos del área de estudio con relación al ENSO, se concluyó que el Niño 2002-2003 generó un período húmedo en el área de estudio. A su vez, la Niña 2007-2008 generó una fuerte sequía en esos años y mitad de 2009. El evento Niña 2007-2008 tuvo un gran impacto en la hidrografía costera del área de estudio por la disminución en las precipitaciones y en el monto total de las descargas de ríos que aportan agua dulce, nutrientes y sedimentos.

La altura del oleaje de la zona costera de Monte Hermoso y Pehuén Co oscila entre 0,25 y 1 m, con períodos menores a 8 segundos. Alturas mayores a 2 m y períodos mayores a 12 segundos tienen sólo el 1 % de probabilidad de ocurrir. Estos resultados son directamente aplicables a la deriva litoral de la zona de estudio y al transporte de sedimentos. La temperatura superficial del mar osciló entre 6 °C a mediados de invierno y 23 °C en verano. La salinidad del mar es muy alta (entre ~34 y 36) como también la turbidez (entre 20 y 100 NTU). Se demostró entonces la gran influencia del estuario de Bahía Blanca en la hidrografía de la zona costera de Pehuén Co y Monte Hermoso.

Se utilizaron imágenes satelitales Aqua MODIS (1 km) como herramienta para obtener datos físicos y biológicos de la zona del Rincón. Se realizó la validación del producto temperatura superficial del mar en la zona de El Rincón con datos *in situ* y se obtuvieron resultados precisos. Por otro lado, se determinaron las propiedades ópticas inherentes a_{ph} , b_{bp} y a_{dg} (absorción por fitoplancton,

retrodispersión por material particulado y absorción por material detrítico) como proxy de las características físico-biológicas del agua y la clorofila-*a* a la vez que se analizó la variabilidad inter-anual y estacional de las mismas en el período 2002-2010. El análisis de las series de tiempo demostró que la variabilidad temporal de los parámetros estuvo dominada por la señal estacional. En la zona costera a_{ph} y b_{bp} presentaron una tendencia positiva y una fuerte variabilidad inter-anual.

Finalmente, se relacionó los desembarques totales anuales de pesca en el puerto de Bahía Blanca con la variabilidad interanual de los parámetros físico-biológicos oceanográficos y atmosféricos. Se demostró que las fluctuaciones climáticas evidenciadas en el presente estudio a partir de las precipitaciones y caudales, generan cambios en la composición física del agua alterando en principio la base de la cadena trófica marina (fitoplancton) y directa o indirectamente al zooplancton y las comunidades pelágicas.

ABSTRACT

The inner shelf of the South of the Buenos Aires Province (El Rincón) is a highly variable environment, which is very important for the natural resources of the area and it remains unknown. In the present work a comprehensive study of the relationship between the climate variability, the spatial and temporal physical characteristics of the inner shelf and the impacts on the marine biology is presented for the very first time.

The climate variability was analyzed by the oscillation of the precipitations, the water balances and discharge of the main rivers. It was concluded that the Niño event (2002-2003) produced a wet period in the area. On contrary, the Niña event (2007-2008) was responsible of a strong drought which continued until mid 2009. The Niña event had a major impact on the coastal hydrography of the study area because of the diminution of the precipitations and the discharge of the rivers, which provide fresh water, nutrients and sediments to the system.

Most of significant wave heights of the coastal zone of Monte Hermoso and Pehuén Co ranged between 0,25 and 1 m, related to significant periods of less than 8 seconds. Wave heights of more than 2 m and periods longer than 12 seconds had only 1 % chance of occurring. These results are important to explain the littoral drift and sediment transport of the study area. Sea surface temperature oscillated between 6 °C in winter and 23 °C in summer. High values of salinity and turbidity were registered (~34 – 36, 20 – 100 NTU, respectively). The physical characteristics of the coastal hydrography of Monte Hermoso and Pehuén Co are clearly driven by the influence of the Bahía Blanca estuary plume on the study area.

MODIS Aqua satellite imagery was used as a tool to obtain physical and biological data of El Rincón zone. The validation of Sea Surface Temperature product was done with *in situ* dataset obtaining accurate results. In addition, the inherent optical properties (IOPs) a_{ph} , b_{bp} and a_{dg} (absorption by phytoplankton, backscattering by particulate matter, absorption by colored dissolved organic matter) and chlorophyll-*a* were used as a proxy to determine the spatial and temporal distribution of the physical and biological characteristics of the sea between 2002-2010. The time series analysis demonstrated that the temporal variability of the parameters was mainly produced by the seasonal signal. In the coastal zone, a_{ph} and b_{bp} had positive tendency and a high inter annual variability.

Finally, annual fish landings in the Bahía Blanca port were related to inter annual variability of the physical-biological oceanographic and atmospheric parameters. The climate fluctuations (precipitations and discharge of the rivers) produce changes in the physical composition of the water, altering the sea food web (phytoplankton) and the zooplankton and pelagic communities.

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