

**Template for Submission of Scientific Information
to Describe Ecologically or Biologically Significant Areas**

Title/Name of the area: Southern Brazilian Sea

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Abstract

The Southern Brazilian Sea EBSA is a region characterized by marked oceanographic complexity and high biological productivity, comprising the continental shelf, the slope and deep waters off southern Brazil, from shoreline up to the 4000 m isobath. This area is strongly influenced by the Brazil and the Malvinas (Falklands) currents, which converge between approximately 32° and 40° S, giving rise to the Subtropical Convergence in the Southwestern Atlantic, and characterizing it as biogeographic transition zone between the large neritic areas of Patagonia and tropical Brazil. Due to this high biological productivity, this same region concentrate highest industrial fishing effort, which had resulted in an overexploitation of several fisheries stocks, some to their collapse, as well as high bycatch, including several endangered species of cetaceans, seabirds, fishes and marine turtles.

Introduction

The Southern Brazilian Sea EBSA is a region characterized by marked oceanographic complexity and high biological productivity, comprising the continental shelf, the slope and deep waters off southern Brazil, from shoreline up to the 4000 m isobath. This area is strongly influenced by the Brazil and the Malvinas (Falklands) currents, which converge between approximately 32° and 40° S, giving rise to the Subtropical Convergence in the Southwestern Atlantic (**Seeliger & Odebrecht 1997**). The marked seasonal latitudinal displacement of the Convergence, characterizes the southern Brazilian continental shelf and slope regions as a biogeographic transition zone between the large neritic areas of Patagonia and tropical Brazil (**Castello *et al.* 1997**).

Interactions between the Subtropical Convergence, continental runoff from the La Plata River (Argentina/Uruguay) and Patos Lagoon, and topographic features favors high biological productivity, and make this region an important reproduction, nursery and feeding grounds for pelagic and demersal fish stocks (Seeliger & Odebrecht 1997, Madureira et al. 2005, Rossi-Wongtschowski & Madureira 2006) and a crucial feeding ground for threatened cetacean, seabirds and marine turtles species (Pinedo 1997, Neves et al. 2006, Zerbini et al. 2004, Bastida et al. 2007, Barros 2010, Proietti et al. 2012). The area is also the main breeding ground for the endangered southern right whale (*Eubalaena australis*) in Brazil (Greig et al. 2001). Due to this high biological productivity, this same region concentrate highest industrial fishing effort, which had resulted in an overexploitation of several fishery stocks, some to their collapse, as well as high bycatch, including endangered species of cetaceans (e.g. the franciscana dolphin), seabirds (e.g. wandering albatross), marine turtles (e.g. green, loggerhead and leatherback sea turtles), fishes (e.g. wreckfish) and sharks (e.g. soupfin shark, angelfish, Brazilian guitarfish) (Haimovici et al. 1997, Neves & Olmos 1998, Cornish and Peres 2003, Vooren & Klippel 2005, Cergole et al. 2006, Secchi et al. 2003, Marcovaldi et al. 2006, Neves et al. 2007, Secchi, 2010, Cardoso et al. 2011, Fiedler et al. in press).

This area has been widely studied along at least 40 years of oceanographic and fisheries research developed by Universities and NGOs.

Location

The Southern Brazilian Sea EBSA extends from Chuí (Brazil-Uruguay boundary) (ca. 34°S) to the proximity of the Santa Marta Grande Cape (Santa Catarina State) (ca. 29°S). The western and eastern limits are the shoreline (ca. 53°W) and the 4000 m isobath (ca. 39°W), respectively. Approximately half of this area falls within the Brazilian EEZ, and part of it is subject to a submission to the Commission on the Limits of the Continental Shelf (Figure 1).

Feature description of the proposed area

The gently sloping continental shelf between Santa Marta Grande Cape and Chuí has a width of 100-180 km and reaches its largest extension between 31° and 33° S. Remnant valleys of ancient channels typically cut the shelf on this region. The transition between shelf and upper slope starts as 160-190 m deep. The slope is considerably wide of up to 250 km near Santa Marta Grande Cape. In some areas it presents a gradual drop to approximately 3000 m deep, while in others the break is more abrupt. Canyons and sea mounts occur in some sectors of the slope (Calliari 1997, Figueiredo Jr. & Madureira 2006). The sedimentation pattern of the shelf and slope are predominantly terrigenous, based in sand/silt/clay components (Calliari 1997, Figueiredo Jr. & Madureira, 2006).

Coastal and shelf break upwelling of deep Subtropical Water is frequent in the spring/summer and winter/spring, respectively. The influence of Subantarctic waters is greatest in the winter, and of the tropical waters in the summer. However, waters of subantarctic origin may also rise during the summer along the southernmost shelf break regions. Freshwater runoff from the La Plata River and the Patos Lagoon become important in the winter and spring (Castello et al. 1997, Garcia 1997). Interactions between the oligotrophic Brazil Current, the nutrient-rich waters of Malvinas (Falklands) Current, and continental runoff make the region important nursery and feeding areas as well as reproduction grounds for fishery stocks of subtropical and antarctic origin which utilize the Brazil and Malvinas (Falklands) currents for long distance transport (Seeliger & Odebrecht 1997).

The high productivity results in a considerable biomass of small pelagic fishes, and also high productive, but now overexploited, demersal fish resources. On the slope and adjacent oceanic waters, during most of the year, the thermal front on the western side of the Subtropical Convergence provides suitable habitat for pelagic sharks, tuna and tuna-like fish (Castello et al. 1997), while on the bottom, between the 400 and 900 m isobath, there are continuous deep sea coral reefs (Pires 2007).

Feature condition and future outlook of the proposed area

The Southern Brazilian Sea EBSA is an area under high fishery effort. In this region, around 700 industrial fishing vessels from Rio Grande (RS) and Itajaí (SC) provide 85% of the southern Brazil landings (**Perez et al. 2001**), accounting for approximately 26% of the total Brazilian catches (**IBAMA/MMA, 2002**). The remaining catches are provided by approximately 8,000 artisanal boats operating on coastal shallow waters or estuaries (**Castello et al. 2011**).

Trawl and gillnet fisheries on the continental shelf represent the major fishing effort in southern Brazil (**Klippel et al. 2005**). Demersal teleosts and elasmobranchs stocks were affected as a whole, and thus their abundance and diversity are at risk under intense and unmanaged fishing (**Haimovici et al. 1997**). This scenario allowed catches of most demersal stocks to unsustainable levels (**Haimovici et al. 1997, Vasconcellos & Gasalla 2001, Castello et al. 2011**) as well as several species threatened to extinction, as the critically endangered elasmobranchs *Rhinobatos horkelli* and *Mustelus fasciatus* (**Vooren et al. 2005, Vooren & Klippel 2005, IUCN 2011**).

Motivated by the overfishing of the main coastal resources, Brazilian government induced vessel-chartering program in order to exploit deep-water of Shelf break (100-250 m) and slope (250-1000 m), centered between 19° and 34° S (**Perez et al. 2003, 2009a**). Foreign-chartered and national longliners, gillnetters, potters, and trawlers started to operate in Brazilian waters through 2000s, mostly targeting demersal teleosts (*Lophys gastrophysus*, *Merluccius hubbsi*, *Urophycis mystacea*, *Polyprion americanus*), squids (*Illex argentinus*), crabs (*Chaceon notialis*, *Chaceon ramosae*) and deep-water shrimps (family Aristeidae) (**Perez et al. 2003, 2009a,b**). Despite intensive data collection, the availability of timely stock assessments, and a formal participatory process for the discussion of management plans, deep-water stocks are already considered to be overexploited due to limitations of governance (**Perez et al. 2009a**).

Pelagic longliners, targeting swordfish, tunas and sharks, operate from the slope to high seas off southern Brazil, including waters beyond the national jurisdiction, where Uruguayan pelagic longline fleets strongly increment the fishing effort (**Neves et al. 2007, Jiménez et al. 2009**). This extensive fishing effort has caused high bycatches of several endangered species of seabirds and turtles during the last twenty years (**Bugoni et al. 2008, Bugoni et al. 2009, Bugoni et al. 2011, Marcovaldi et al. 2006, Sales et al. 2008, Pons et al. 2010**).

The high and unmanaged fishing effort on the coast and off southern Brazil is responsible for the high bycatch of magellanic penguins, as well as endangered albatrosses and petrels, marine turtles, and small cetaceans species or populations (**Neves & Olmos 1998, Secchi et al. 2003, Marcovaldi et al. 2006, Neves et al. 2007, Jiménez et al. 2009, Fruet et al. 2010, Secchi 2010, Cardoso et al. 2011, Fiedler et al. in press**).

Assessment of the area against CBD EBSA Criteria

(Discuss the area in relation to each of the CBD criteria and relate the best available science. Note that a candidate EBSA may qualify on the basis of one or more of the criteria, the boundaries of the EBSA need not be defined with exact precision. And modeling may be used to estimate the presence of EBSA attributes. Please note where there are significant information gaps.)

CBD EBSA Criteria (Annex I to decision IX/20)	Description (Annex I to decision IX/20)		R a n k i							

			ng of c r i t e r i o n r e l e v a n c e (p l e a s e m a r k o n e c o l u m n w i t h a n							
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			X						
			Down, known	Low			Some		High
Uniqueness or rarity	Area contains either (i) unique (“the only one of its kind”), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features						x		

The proposed EBSA is a region characterized by marked and unique oceanographic complexity and high biological productivity. This area is strongly influenced by the Subtropical Convergence, and is characterized as biogeographic transition zone between the large neritic areas of Patagonia and tropical Brazil (**Castello *et al.* 1997, Seeliger & Odebrecht 1997**).

Interactions between the Subtropical Convergence, continental runoff from the La Plata River (Argentina/Uruguay) and Patos Lagoon, topographic features as canyons and sea mounts on the slope, and coastal and shelf break upwelling enhance the oceanographic complexity and the uniqueness of this area (**Calliari 1997, Castello *et al.* 1997, Garcia 1997, Madureira *et al.* 2005, Figueiredo Jr. & Madureira 2006**).

Special importance for life-history stages of species	Areas that are required for a population to survive and thrive.							x	
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The Southern Brazil Sea EBSA because of its high biological productivity supplies food for many species. It is an important foraging ground for breeding and non-breeding Procellariiformes such as Wandering Albatross (*Diomedea exulans*), Tristan Albatross (*Diomedea dabbenena*), Atlantic yellow-nosed Albatross (*Thalassarche chlororhynchos*), Spectacled petrel (*Procellaria conspicillata*), White-chinned Petrel (*Procellaria aequinoctialis*). In addition, several species forage on the area only during non-breeding periods, such as Black-browed Albatross (*Thalassarche melanophris*), Northern Royal Albatross (*Diomedea sanfordi*), Southern Royal Albatross (*Diomedea epomophora*) and Shy-type Albatross (*Thalassarche cauta/steady*). (**Neves *et al.* 2006, Olmos *et al.* 2006, Gianuca *et al.* 2011**). The area is also the main breeding ground for the endangered southern right whale (*Eubalaena australis*) in Brazil (**Greig *et al.* 2001, Groch *et al.* 2005**). At least 35 cetacean species also utilize the area as feeding and breeding ground or as migratory corridor for baleen whales from their wintering habitat in Brazil to foraging grounds in subantarctic and antarctic waters (**Zerbini *et al.* 1996, 1997, Bastida *et al.* 2007, Ott *et al.* 2009**).

This area comprises migratory and foraging habitats for adult leatherbacks (*Dermochelys coriacea*) (**Almeida *et al.* 2011**) and also as foraging for both small and large immature loggerhead turtles (*Caretta caretta*) as well as juveniles

green turtle (**Bugoni et al. 2003, Barros 2010, Barros et al. 2010, Barceló 2011**). The shelf waters of southern Brazil also are essential habitat for 26 elasmobranchs species, of which, 21 utilizes the coastal waters as reproductive and nursery grounds (**Vooren & Klippel 2005**).

This area includes the only known spawning aggregation sites for the Southwestern Atlantic wreckfish, *Polyprion americanus*, population (Peres and Klippel, 2003) and although it occurs from Rio de Janeiro, Brazil, to Argentina, the highest abundance is off Southern Brazil (200-600m deep) (Peres and Haimovici, 1998; Haimovici e Peres, 2005). The southern Brazilian slope are also important reproductive area for the important ecologically *Illex argentinus* from the Patagonian shelf stock (**Perez et al. 2009b**).

Importance for threatened, endangered or declining species and/or habitats	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.							x
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Because this area is very important and subjected to high fishing intensity for the last decades, there are now, many endangered or declining species, populations or ecosystems dependent on the Southern Brazil Sea EBSA.

Among the Procellariiforms that regularly use the area, one is *Critically Endangered* (Tristan Albatross), three are *Endangered* (Northern Royal, Black-browed and Atlantic Yellow-nosed Albatrosses), four are *Vulnerable* (Wandering and Southern Royal albatrosses, White-chinned, Spectacled and Tristan petrels) and one is classified as *Near Threatened* (White-capped/shy Albatross) (**IUCN 2011**).

The the three sea turtle species that regularly use the are either critically endangered (*Dermochelys coriacea*) or endangered (*Caretta caretta* and *Chelonia mydas*) species (**IUCN 2011, Almeida et al. 2011, Santos et al. 2011**). The franciscana dolphin (*Pontoporia blainvillei*) occurs year around in the coastal portion of this area. This species was recently listed as *Vulnerable* in the IUCN Red Book (**IUCN, 2011**) due mainly to unsustainable bycatch in gillnet fishery and is, perhaps, the mostly endangered cetacean species in the western South Atlantic (**Secchi et al., 2003, Secchi, 2010**). Of the 37 elasmobranch species recorded in southern Brazil, 14 are overexploited (IN 05, MMA, 24/05/2004) due to catches by the artisanal and industrial fisheries, either as target or as bycatch (**Vooren & Klippel 2005**). Accordingly to the IUCN (2011), two are Critically Endangered (*Mustelus fasciatus*, *Rhinobatos horkelli*), five Endangered (*Mustelus schmitti*, *Squatina argentina*, *Squatina guggenheim*, *Sphyrna lewini*, *Rhinoptera brasiliensis*) and 14 Vulnerable (*Alopias superciliosus*, *Alopias vulpinus*, *Carcharhinus plumbeus*, *Carcharhinus signatus*, *Gymnura altavela*, *Rioraja agassi*, *Sympterygia acuta*, *Sphyrna zigaena*, *Carcharias taurus*, *Galeorhinus galeus*, *Zapteryx brevirostris*, *Isurus oxyrinchus*, *Isurus paucus*, *Lamna nasus*).

This area includes the only known spawning aggregation sites (**Peres & Klippel, 2003**) for the Critically Endangered Southwestern Atlantic wreckfish population (**Cornish & Peres, 2003**) and although it occurs from Rio de Janeiro, Brazil to Argentina, the highest abundance is off Southern Brazil (200-600m deep) (**Peres & Haimovici, 1998; Haimovici & Peres, 2005**).

Vulnerability, fragility, sensitivity, or slow recovery	Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.							x		
Several endangered species of long-lived and slow reproducing seabirds, marine mammals and turtles, have been strongly impacted by the bycatch resulted from the intense and unmanaged fishing activities in southern Brazil (Neves & Olmos 1998, Secchi <i>et al.</i> 2003, Marcovaldi <i>et al.</i> 2006, Neves <i>et al.</i> 2007, Jiménez <i>et al.</i> 2009, Secchi 2010, Cardoso <i>et al.</i> 2011, Fiedler <i>et al.</i> in press). several species of elasmobranchs concentrates in shallow coastal waters during the reproduction period, when it became o highly vulnerable to the coastal fisheries (Vooren & Klippel 2005). In the slope, between 400 and 900 m deep, there are vast and continuous fragile deep sea coral reefs, composed by the five most important deep sea reef builders' species: <i>Lophelia pertusa</i>, <i>Solenosmilia variabilis</i>, <i>Enallopsmmia rostrata</i>, <i>Madrepora oculata</i>, <i>Dendrophyllia alternata</i> (Pires 2007). The Southwestern Atlantic wreckfish, <i>Polyprion americanus</i>, population is specially vulnerable to intensive fisheries because it is long-lived (more than 80 years), late maturing (10-15 years), and forms spawning aggregations at specific sites and seasons (Peres and Haimovici, 2004; Peres and Klippel, 2003; Peres, 2000). In 2004, recognizing this vulnerability, the Brazilian government determined a fishery closure (moratorium) for ten years, but after about 8 years, there are no registered signs of population recovery off southern Brazil.										
Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.									x
Interactions between the Subtropical Convergence, continental runoff from the La Plata River (Argentina/Uruguay) and Patos Lagoon, and topographic features favors high biological productivity, and make this region an important reproduction, nursery and feeding grounds for pelagic and demersal fish stocks, which presents relatively high biomass in all trophic levels (Castello <i>et al.</i> 1997, Seeliger & Odebrecht 1997, Zerbini <i>et al.</i> 2004, Madureira <i>et al.</i> 2005, Rossi-Wongtschowski & Madureira 2006, Olmos <i>et al.</i> 2006, Bastida <i>et al.</i> 2007, Secchi 2009).										
Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.							x		
The marked seasonal latitudinal displacement of the Convergence, characterizes the southern Brazilian continental shelf and slope regions as a biogeographic transition zone between the large neritic areas of Patagonia and tropical Brazil containing elements of fauna and flora from both areas as well as typical species from the mixture zone (Castello <i>et al.</i> 1997, Seeliger and Odebrecht 1997, Zerbini <i>et al.</i> 2004, Olmos <i>et al.</i> 2006, Bastida <i>et al.</i> 2007, Ott <i>et al.</i> 2009).										

Naturalness		Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.			X						
The Southern Brazilian Sea EBSA is an area under intense fishery effort of longliners, gillnetters, potters, and trawlers from coastal areas to high seas (Haimovici <i>et al.</i> 1997, Perez <i>et al.</i> 2003, Klippel <i>et al.</i> 2005, Perez 2009a,b, Vasconcellos & Gasalla 2001, Castello <i>et al.</i> 2011).											

Sharing experiences and information applying other criteria (Optional)

Other Criteria	Description	Ranking of criterion relevance (please mark one column with an X)			
		Don't Know	Low	Some	High
<i>Add relevant criteria</i>					
<i>Explanation for ranking</i>					

References

- Almeida, de P.A.; Thomé, J.C.A.; Baptistote, C.; Marcovaldi, M.Â., Santos, A.S. dos; Lopez, M. 2011a. Avaliação do Estado de Conservação da Tartaruga Marinha *Dermochelys coriacea* (Vandelli, 1761) no Brasil. *Revista Biodiversidade Brasileira* Ano I, n. 1, 37-44.
<https://www2.icmbio.gov.br/revistaelectronica/index.php/BioBR/article/viewFile/90/75>
- Almeida, A.P., Moreira, L.M.P., Bruno, S.C., Thomé, J.C.A., Martins, A.S., Bolten, A.B., Bjorndal, K.A. 2011b. Green turtle nesting on Trindade Island, Brazil: abundance, trends, and biometrics. *Endangered Species Research*, 14: 193-201.
- Barcelo, C. 2011. Movement Patterns and Marine Habitat Associations of Juvenile Loggerhead Sea Turtles (*Caretta caretta*) in the Southwestern Atlantic Ocean. Master Thesis. Oregon State University.
<http://ir.library.oregonstate.edu/xmlui/handle/1957/23015>
- BARROS, J.A.; D.S. MONTEIRO; M.S. COPERTINO; S.C. ESTIMA & D.L.V. DUARTE. 2010. Feeding of juvenile Green Turtles (*Chelonia mydas*) in Southern Brazil. Proceedings of the twenty-eighth Annual Symposium on Sea Turtle Biology and Conservation. NOAA Technical Memorandum NOAA NMFS-SEFSC-602: 128p. 16:12
- Barros, JA (2010) Alimentação da tartaruga-cabeçuda (*Caretta caretta*) em habitat oceânico e nerítico no sul do Brasil: composição, aspectos nutricionais e resíduos sólidos antropogênicos. Dissertation, Universidade Federal do Rio Grande.
- Bastida, R., Rodriguez, D., Secchi, E. R., & Da Silva, V.M.F. (2007). *Mamíferos Acuáticos de Sudamérica y Antártida*. Vazquez Mazzini Editores, vol.1. Buenos Aires. 360pp.
- BUGONI, L, PL MANCINI, DS MONTEIRO, L NASCIMENTO & TS NEVES. 2008. Seabird bycatch in the Brazilian pelagic longline fishery and a review of capture rates in the Southwestern Atlantic Ocean. *Endang. Species Res.*, 5: 137-147.
- BUGONI, L, L D'ALBA & RW FURNESS. 2009. Marine habitat use of wintering Spectacled Petrels *Procellaria conspicillata* and overlap with longline fishery. *Mar. Ecol. Prog. Ser.*, 374: 273-285.
- BUGONI, L, K GRIFFITHS & RW FURNESS. 2011. Sex-biased incidental mortality of albatrosses and petrels in longline fisheries: Differential distributions at sea or differential access to baits mediated by sexual size dimorphism? *J. Ornithol.*, 152: 261-268.
- BUGONI, L.; L. KRAUSE & M.V. PETRY. 2003. Diet of sea turtles in southern Brazil. *Chelonian Conservation and Biology* 4: 685 – 688.
- Calliari, L.J. 1997. Geomorphological Setting. In: Seeliger, U., Odebrecht, C. & Castello, J.P. (Eds.). *Subtropical Convergence Environments: the coast and the sea in the southwestern Atlantic*. Springer-Verlag, Berlin. Pp 91-93.
- Castello, J.P., Sunye, P.S., Haimovici, M. & Hellebrandt, D. 2011. Pescarias marinhas e estuarinas do sul do Brasil: comparação de manejo e sustentabilidade. In: Haimovici, M. (ed.). *Sistemas pesqueiros marinhos e estuarinos do Brasil*. Rio Grande, Editora da FURG. Pp. 93-101.

Castello, J.P., Haimovici, M., Odebrecht, C. & Vooren, C.M. 1997. The continental shelf and slope. In: Seeliger, U., Odebrecht, C. & Castello, J.P. (Eds.). *Subtropical Convergence Environments: the coast and the sea in the southwestern Atlantic*. Springer-Verlag, Berlin. Pp171-178.

Cardoso, L.G., Bugoni, L., Mancini, P. & Haimovici, M. 2011. Gillnet fisheries as major mortality factor of Magellanic penguins in wintering areas. *Marine Pollution Bulletin*, 62: 840-844.

Cergole, M.C., Ávila da Silva, A.O. & Rossi-Wongtschowski, C.L.D.B. 2006. *Análise das principais pescarias comerciais da região Sudeste-Sul do Brasil: dinâmica populacional das espécies em exploração*. São Paulo: USP. (Série documentos Revizee: Score Sul). 176 p.

Cornish, A.S. & Peres, M.B. 2003. *Polyprion americanus* (Brazilian subpopulation). In: IUCN 2003. 2003 IUCN Red List of Threatened Species. (<http://www.iucnredlist.org/>).

Fiedler, F.N., Sales, G., Giffoni, B.B., Monteiro-Filho, E.L.A., Secchi, E.R., Bugoni, L. (in press). Driftnet fishery threatens sea turtles in the Atlantic Ocean. *Biodiversity and Conservation*.

Figueiredo Jr., A.G. & Madureira, L.S.P. 2006. *Topografia, composição, reflectividade do substrato marinho e identificação de províncias sedimentares na região sudeste-sul do Brasil*. São Paulo: USP. (Série documentos Revizee: Score Sul). 64 p.

Fruet, P.F., Kinas, P.G., Da Silva, K.G., Di Tullio, J.C., Monteiro, D.S., Dalla Rosa, L., Estima, S. & Secchi, E.R. 2010. Temporal trends in mortality and effects of by-catch on common bottlenose dolphins, *Tursiops truncatus*, in southern Brazil. *Journal of the Marine Biological Association of the United Kingdom*, 91: 1-12.

Garcia, C.A.E. 1997. Physical Oceanography. . In: Seeliger, U., Odebrecht, C. & Castello, J.P. (Eds.). *Subtropical Convergence Environments: the coast and the sea in the southwestern Atlantic*. Springer-Verlag, Berlin. Pp 94-95.

Gianuca, D., Peepes, F. & Neves, T. 2011. New records of shy-type albatrosses (*Thalassarche steadi/cauta*) in Brazil. *Revista Brasileira de Ornitologia*, 19: 545-551.

Greig, A.B., E.R., Secchi, A.N. Zerbini, & L., Dalla Rosa (2001). Stranding events of southern right whales, *Eubalaena australis*, in southern Brazil. *Journal of Cetacean Research and Management* (special issue) 2:157-60.

Groch, K.R., J.T.Pallazo Jr., P.A.C. Flores, F.R. Adler & M.E. Fabian. 2005. Recent rapid increase in the right whale (*Eubalaena australis*) population off southern Brazil. *Latin American Journal of Aquatic Mammals*. 4:41-47.

Haimovici, M., Rossi-Wongtschowski, C.L.D.B., Cergole, M.C., Madureira, L.S., Bernardes, R.A. & Ávila-da-Silva, A.O. 2006. Recursos pesqueiros da região sudeste-sul. In: *Programa REVIZEE: Avaliação do potencial sustentável de recursos vivos da Zona Econômica Exclusiva: Relatório Executivo, Capítulo 6*. Brasília, Ministério do Meio Ambiente. Pp. 207-242.

IBAMA/MMA.2002. Estatística da Pesca, Brasil: Grandes regiões e unidades da federação. Tamandaré, CEPENE. 100 p.

IUCN 2011. IUCN Red List of Threatened Species. Version 2011.2. <www.iucnredlist.org>. Downloaded on 14 February 2012.

Jiménez, S., Domingo, A. & Brazeiro, A. 2009. Seabird bycatch in the Southwest Atlantic: interaction with the Uruguayan pelagic longline fishery. *Polar Biology*, 32:187–196.

Marcovaldi, M.A., Sales, G., Thomé, J.C.A., Dias da Silva, A.C.C., Gallo, B.M.G., Lima, E.H.S.M., Lima, E.P. & Bellini, C. 2006. Sea Turtles and Fishery Interactions in Brazil: Identifying and Mitigating Potential Conflicts. *Marine Turtle Newsletter*, 112:4-8.

Monteiro, D.S. 2004. Encalhes e interação de tartarugas marinhas com a pesca no litoral do Rio Grande do Sul. Bachelors thesis. Fundação universidade do Rio Grande, RS, Brazil.

Neves, T. & Olmos, F. 1998. Albatross mortality in fisheries off the coast of Brazil. In: Robertson, G. & Gales, R. (eds.). *Albatross biology and conservation*. Surrey Beatty: Chipping Norton. Pp. 214–219.

Neves, T., Vooren, C.M., Bugoni, L., Olmos, F. & Nascimento, L. 2006. Distribuição e abundância de aves marinhas na região sudeste-sul do Brasil. In: Neves, T., Bugoni, L. & Rossi-Wongtschowski, C.L.B. (Orgs.). *Aves oceânicas e suas interações com a pesca na região sudeste-sul do Brasil*. São Paulo: USP. (Série documentos Revizee: Score Sul). Pp. 11-35.

Neves, T., Mancini, P.L., Nascimento, L., Miguéis, A.M.B. & Leandro Bugoni. 2007. Overview of seabird bycatch by Brazilian fisheries in the South Atlantic. *Collective Volume of Scientific Papers*, 60: 2085-2093.

Olmos, F., Bugoni, L., Neves, T., Peppes, F. 2006. Caracterização das aves oceânicas que interagem com a pesca de espinhel no Brasil. In: Neves, T.; Bugoni, L. & Rossi-Wongtschowski, C. L. B. (Orgs.). *Aves oceânicas e suas interações com a pesca na região sudeste-sul do Brasil*. São Paulo: USP. (Série documentos Revizee: Score Sul). Pp. 37-67.

OTT, P. H. et al. Mamíferos marinhos do litoral gaúcho. In: WÜRDIG, N. L.; FREITAS, S. M. F. (Org.). **Ecosistemas e Biodiversidade do Litoral Norte do RS**. Porto Alegre: Nova Prova Editora, 2009. p. 236-257.

Perez, J.A.A., Pezzuto P.R., Wahrlich, R., & Ana Luisa de Souza Soares, A.L.S. 2009a. Deep-water fisheries in Brazil: history, status, and perspectives. *Latin American Journal of Aquatic Research*, 37: 513-141.

Perez, J.A.A., Silva, T.N., Schroeder, R., Schwarz, R. & Silvestre, R. 2009b. Biological patterns of the Argentine shortfin squid *Illex argentine* in the slope trawl fishery off Brazil. *Latin American Journal of Aquatic Research*, 37: 409-428.

Perez, J.A.A., Pezzuto P.R., Wahrlich, R., & Ana Luisa de Souza Soares, A.L.S. 2003. Deep sea fisheries off southern Brazil: recent trends of the Brazilian fishery industry. *Journal of the Northwest Atlantic Fishery*, 31:1-18.

Perez, J.A.A., Pezzuto, P.R., Rodrigues, L.F., Valentini, H. & Vooren, C.M. (relatores). 2001. Relatório da reunião técnica de ordenamento da pesca de arrasto nas regiões sudeste e sul do Brasil. *Notas Técnicas da Facimar*, 5: 3-34.

Peres, M.B. and S. Klippel. 2003. Reproductive biology of southwestern Atlantic wreckfish, *Polyprion americanus* (Teleostei: Polyprionidae). *Environmental Biology of Fishes* 68: 163–173.

Peres, M.B. and M. Haimovici. 1998. A pesca dirigida ao cherne-poveiro, *Polyprion americanus* (Polyprionidae, Teleostei) no sul do Brasil. *Atlântica* (1998), 20: 141-161

Peres, M.B. and M. Haimovici. 2004. Age and growth of southwestern Atlantic wreckfish *Polyprion americanus*. *Fisheries Research* 66 (2004) 157–169

Peres, M.B. 2000. Dinâmica populacional e pesca do cherne-poveiro *Polyprion americanus* (Bloch & Schneider, 1801) (Teleostei: Polyprionidae) no sul do Brasil. PhD Thesis. Fundação Universidade do Rio Grande (FURG).

Pires, D.O. 1997. The azoochanthellate coral fauna of Brazil. Pp. 265-272. In: George, R.Y. & Cairns, S.D. *Conservation and adaptive management of seamount and deep-sea coral ecosystems*. Rosentiel School of Marine and Atmospheric Science. University of Miami, Miami.

Pons, M.; Domings, A.; Sales, G.; Fiedler, F.N.; Miller, P.; Giffoni, B.; Ortiz, M. 2010. standardization of CPUE of loggerhead sea turtle (*Caretta caretta*) caught by pelagic longliners in the Southwestern Atlantic Ocean. v *Aquatic Living Resources*, 23: 65–75.

Proietti, M.C. ; Reisser, J.W. ; [Kinas, P.G.](#); Kerr, R. ; Monteiro, D. ; Monteiro, D.S. ; Marins, L. F.; Secchi, E. R. (2012). Green turtle *Chelonia mydas* mixed stocks in the western South Atlantic, as revealed by mtDNA haplotypes and drifter trajectories. *Marine Ecology Progress Series* 447:195-209.

Sales, G; Giffoni, B B; Barata, P C R. 2008. Incidental catch of sea turtles by the Brazilian pelagic longline fishery. *Journal of the Marine Biological Association of the United Kingdom*. 88(4): 853-864.

Santos, A.S., Soares, L.S. & Marcovaldi, M.A., Monteiro, D. da S., Gifoni, B. Almeida, A. de P. 2011. Avaliação do estado de conservação da tartaruga marinha *Caretta caretta* Linnaeus, 1758 no Brasil. *Revista Biodiversidade Brasileira* Ano I, Nº 1, p.3-11.

<https://www2.icmbio.gov.br/revistaeletronica/index.php/BioBR/article/view/86>

Secchi, E. R. (2010). Review on the threats and conservation Status of Franciscana, *Pontoporia blainvillei* (Cetacea, Pontoporiidae) In: *Biology, Evolution and Conservation of River Dolphins within South America and Asia*. 1st ed. Hauppange : Nova Science Publishers Inc., p. 323-339.

Secchi, E.R., Ott, P.H. & Danilewicz, D.S. (2003). Effects of fishing by-catch and conservation status of the franciscana dolphin, *Pontoporia blainvillei*. Pages 174-191 in Gales, N., Hindell, M. & Kirkwood, R. (Eds) *Marine Mammals: Fisheries, Tourism and Management Issues*. CSIRO Publishing. Collingwood, Australia. 458pp.

Seeliger, U. & Odebrecht, C. 1997. Introduction and overview. In: Seeliger, U., Odebrecht, C. & Castello, J.P. (Eds.). *Subtropical Convergence Environments: the coast and the sea in the southwestern Atlantic*. Springer-Verlag, Berlin. Pp 1-3.

Vasconcellos, M. & Gasalla, M.A. 2001. Fisheries catches and the carrying capacity of marine ecosystem in southern Brazil. *Fisheries Researches*, 50: 279-295.

Vooren, C.M., Lessa, R.P. & Klippel, S. 2005. Biologia e status de conservação da viola *Rhinobatos horkelli*. In: Vooren, C.M. & Klippel, S (Eds.). *Ações para a conservação de tubarões e raias no sul do Brasil*. Igaré, Porto Alegre. Pp. 33-56.

Klippel, S., Peres, M.B., Vooren, C.M. & Lamónaca (2005) A pesca industrial no sul do Brasil. In: Vooren, C.M. & Klippel, S. (Eds.). *Ações para a conservação de tubarões e raias no sul do Brasil*. Igaré, Porto Alegre. Pp. 135-178.

Vooren, C.M., & Klippel, S. 2005. Biologia e status de conservação do caco-listrado *Mustelus fasciatus*. In: Vooren, C.M. & Klippel, S (Eds.). Ações para a conservação de tubarões e raias no sul do Brasil. Igaré, Porto Alegre. Pp. 83-98.

ZERBINI, A.N., E.R. SECCHI, S. SICILIANO & P.C. SIMÕES-LOPES (1996). The dwarf form of the minke whale, *Balaenoptera acutorostrata* Lacépede 1804, in Brazil. *Reports of the International Whaling Commission* 46:333-340.

ZERBINI, A.N., E.R. SECCHI, S. SICILIANO & P.C. SIMÕES-LOPES (1997). A review of the occurrence and distribution of whales of the genus *Balaenoptera* along the Brazilian coast. *Reports of the International Whaling Commission* 47:407-417.

Zerbini, A.N., Secchi, E.R., Bassoi, M., Dalla Rosa, L., Higa, A., De Souza, L., Moreno, I.B, Moller, L.M & Caon, G. (2004). Distribuição e abundância relativa de cetáceos na Zona Econômica Exclusiva da região sudeste-sul do Brasil. *Série documentos REVIZEE-Score Sul*. 40pp.

Maps and Figures

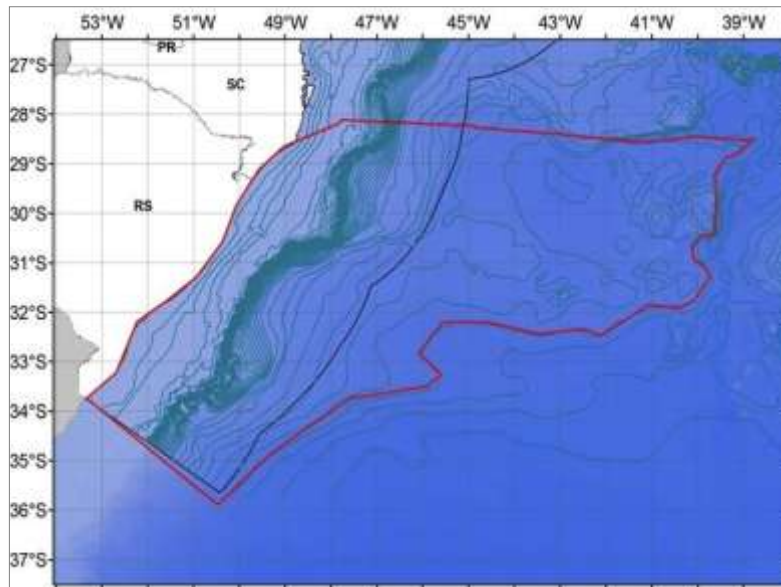


Figura 1: Contours of the proposed *Southern Brazilian Sea* EBSA (red line) and of the Brazilian EEZ (black line).

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