

Short Note

First Report of a South American Fur Seal (*Arctocephalus australis*) in Mexico

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Individuals of several pinniped species have been reported hundreds or thousands of kilometers beyond the traditional limits of their breeding and foraging areas (Reeves et al., 1992). In this respect, the global distribution of pinnipeds is largely constrained by the temperature of the ocean and its effect on the availability of different

food resources; changes in sea surface temperature (SST) and thermocline depth due to El Niño Southern Oscillation (ENSO) events affect the distribution of different species of this suborder (Ceballos et al., 2010; Oliveira, 2011). In the last decade, there have been several reports (sightings and strandings) of sea lions and fur seals in the

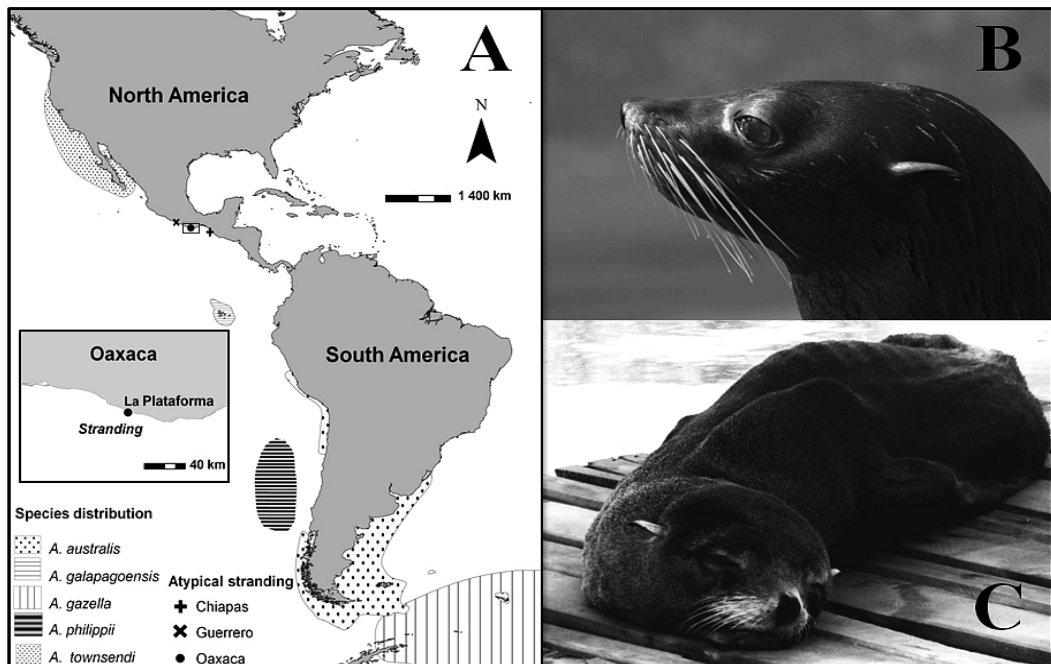


Figure 1. (A) Atypical sea lion strandings in Mexico, distribution, and dispersal of the genus *Arctocephalus* in the Americas (from www.iucnredlist.org), and the location of the *A. australis* stranded in Oaxaca, Mexico; (B & C) the specimen receiving care at the Centro Mexicano de la Tortuga (National Mexican Turtle Center) in Mazunte.

Mexican South Pacific. These are unusual events because no pinniped populations inhabit the region. However, *Zalophus californianus* (Lesson, 1828) (Guerrero and Oaxaca), *Arctocephalus galapagoensis* (Heller, 1904) (Guerrero and Chiapas), *Eumetopias jubatus* (Schreber, 1776) (Colima),

and *Z. wollebaeki* (Sivertsen, 1953) (Chiapas) (Gallo-Reynoso & Solorzano-Velasco, 1991; Aurióles-Gamboá et al., 2004; Ceballos et al., 2010) have been sighted in the region. In the Americas, the genus *Arctocephalus* is limited to four species with highly localized distributions:

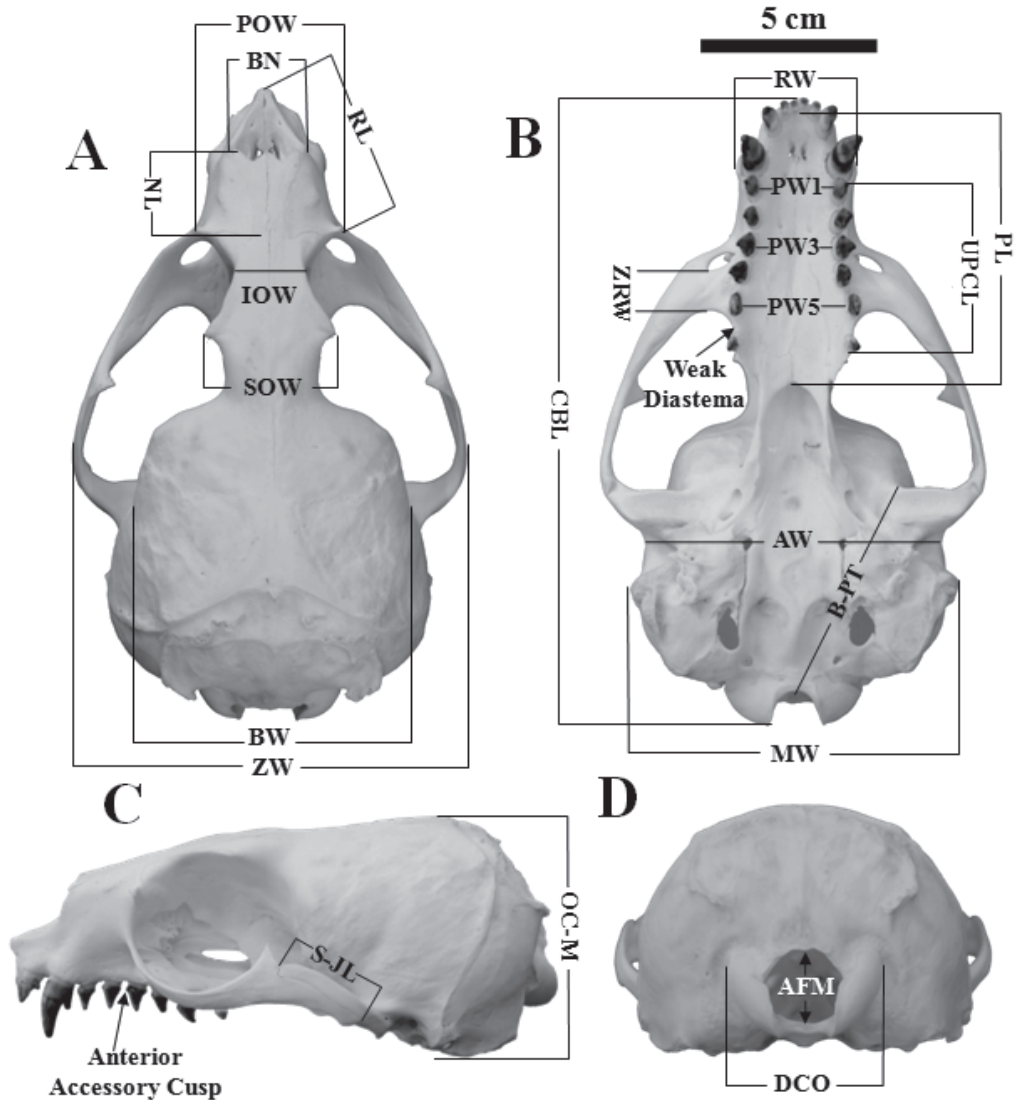


Figure 2. Skull measurements from adult female South American fur seal in the dorsal (A), ventral (B), lateral (C), and occipital (D) view of the skull, based on Daneri et al. (2005) and Oliveira et al. (2005): AFM – maximum of height of the foramen magnum; AW – auditory width, BN – breadth of nasals, B-PT – distance between basion and bend of pterygoid, BW – braincase width, CBL – condylobasal length, DCO – maximum distance between the condyles, IOW – interorbital width, MW – mastoid width, NL – greatest length of nasals, OC-M – occipital crest-mastoid, PL – palatal length, POW – preorbital width, PW1 – palate width at postcanine 1, PW3 – palate width at postcanine 3, PW5 – palate width at postcanine 5, RL – rostral length, RW – greatest rostral width, S-JL – squamosal-jugal suture length, SOW – supraorbital width, UPCL – upper postcanine length, ZRW – zygomatic root width, and ZW – zygomatic width

(1) *A. townsendi* is found on Guadalupe Island and the San Benito Archipelago in Mexico (Aurioles-Gamboa et al., 2010; Esperón-Rodríguez & Gallo-Reynoso, 2012); (2) *A. galapagoensis* inhabits the Galapagos Islands (Clark, 1975); (3) *A. philippii* (Peters, 1866) is found on the Juan Fernández Islands with occasional sightings from southern Peru to southern Chile (Aurioles-Gamboa & Trillmich, 2008); and *A. australis* (Zimmermann, 1783) inhabits the continental margins of the Pacific and Atlantic coasts of South America, from southern Brazil to the Paracas Peninsula of southern Peru (Vaz-Ferreira, 1982) (Figure 1A). However, there have been occasional sightings of *A. tropicalis* (Gray, 1872) in southern South America (Aguir dos Santos & Haimovici, 2001) and on the Juan Fernández Islands west of Chile (Torres & Aguayo, 1984); meanwhile, *A. gazella* (Peters, 1875) has been sighted in South Georgia and the South Sandwich Islands and just north of the Antarctic Convergence (Bonner, 1968).

This short note reports the first record of a South American fur seal (*A. australis*) in Mexico, sighted on 2 May 2013 in Playa La Plataforma (15° 45' N, 96° 53' W), El Rosedal, Santa María Colotepec Municipality, Oaxaca, Mexico. Extensive sandy beaches nestled between isolated rocky edges characterize this coastal area of the Mexican South Pacific. Local residents reported the live stranding of this adult female fur seal to the Procuraduría Federal de Protección al Ambiente (PROFEPA; Federal Attorney for Environmental Protection); specialists transferred the animal to the Centro Mexicano de la Tortuga (CMT; National Mexican Turtle Center) where an external inspection was conducted to determine the cause of the stranding. No injuries or strikes were identified, and no fractures or other bone injuries were visible in X-rays. However, the individual presented low weight (16 kg) and emaciation (Figure 1B & C). The total length (from tip of nose to tip of tail) was 122 cm.

The species was identified as *A. australis* after Reeves et al. (2002). Drs. Diana Szteren and Valentina Franco, specialists from the Universidad de la República (Faculty of Sciences, University of the Republic) in Montevideo, Uruguay, confirmed the identification after inspecting photographs of the individual. The specimen died following 12 d of treatment, which consisted of an intravenous application of restorative serum, antibiotic (Enrofloxacin), and Ranitidine, as well as a Vitamine B Complex, and a nutritious paste, which was administered orally using a syringe. The individual did not accept any type of fresh food (Carlos A. Montalvo, Centro Mexicano de la Tortuga, pers. comm.). The full skeleton and skin were obtained, permitting

confirmation of the characteristics diagnostic of *A. australis* based on the criteria published by Repenning et al. (1971) (see Figure 2): the dentition showed just one primary cusp, including the suggestion of an anterior accessory cusp in the first through fourth postcanines and a weak diastema between the fifth and sixth postcanines. The dental formula was I3/2, C1/1, PC6/5, for a total of 36 teeth. In addition, 20 cranial measurements were taken following Daneri et al. (2005) and Oliveira et al. (2005) using Fowler vernier calipers with an error of 0.1 mm (Table 1). The osteological material and skin were entered into the Colección Osteológica de Mamíferos Marinos de la Universidad del Mar (Marine Mammal Osteological Collection at the University of the Sea in Oaxaca) as COMMUMAR-130013AA1 and COMMUMAR-130013AA1P, respectively. This is the first report of *A. australis* in Mexico, representing the first atypical sighting at ~4,000 km

Table 1. Cranial measurements and values in millimeters of the adult female South American fur seal (*A. australis*)

Acronym	mm
AFM	21.12
AW	89.42
BN	22.72
B-PT	69.26
BW	49.94
CBL	189.82
DCO	20.65
IOW	19.89
MW	97.66
NL	25.48
OC-M	66.84
PL	77.08
POW	42.26
PW1	21.50
PW3	24.04
PW5	31.18
RL	55.28
RW	35.70
S-JL	29.90
SOW	36.97
UPCL	50.69
ZRW	12.61
ZW	116.43

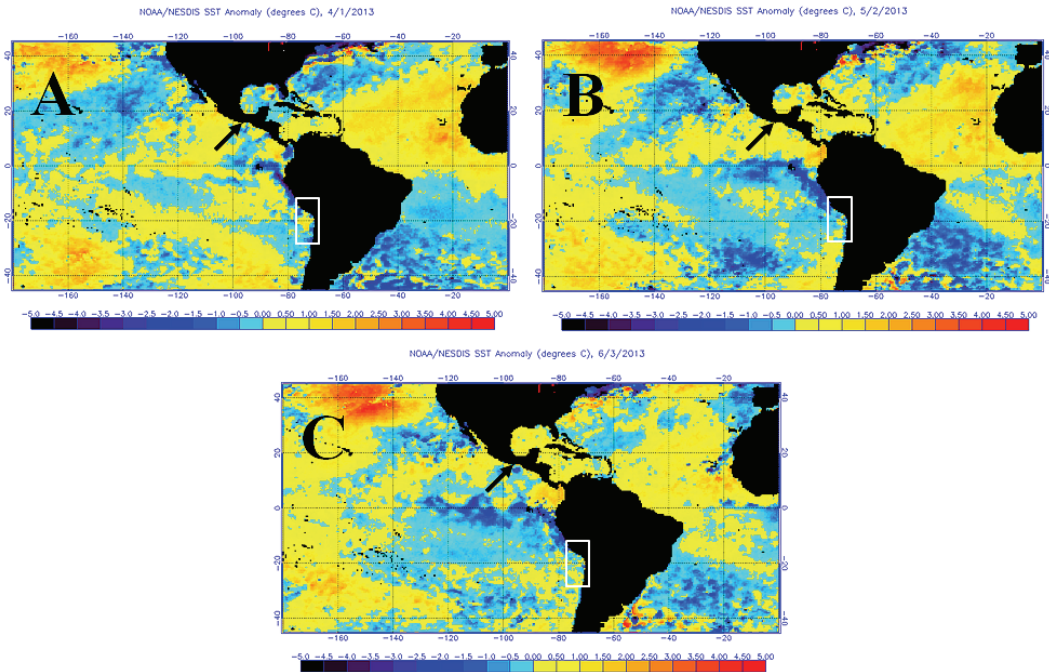


Figure 3. Anomalous sea surface temperature (ASST) during 2013, registered between the Peru and Ecuador coastal regions, displacing northward from the beginning of April (A) to May (B) and June (C); northernmost Pacific distribution of *A. australis* (square) and where our specimen was found (arrow). Satellite images were obtained from www.ospo.noaa.gov/Products/ocean/sst/anomaly/2013.html.

(2,482 nmi) from central Peru ($15^{\circ} 45' N$, $76^{\circ} 24' W$), the closest point of the species' natural distribution in the Pacific (Campagna, 2008).

This unprecedented record is important because it is the first reported for the state of Oaxaca and for Mexico in general; it also is relevant because the South American fur seal has a stable population, yet it is nonetheless seriously impacted by ENSO events (Campagna, 2008; Oliveira, 2011). The presence of this species in the Mexican Tropical Pacific could be related to an anomalous sea surface temperature (ASST) during that period, which were related to La Niña conditions (cold temperatures) that are opposite of those observed for El Niño (warm phase). In relation to the average records for the region, temperatures of $-2^{\circ} C$ were registered between the Peru and Ecuador coastal regions, displacing northward from the beginning of April to the end of June (Figure 3). We hypothesize that these anomalous cold conditions in 2013 allowed an unusual dispersion by our fur seal toward Mexican coasts. Thus, it is important that we continue monitoring their populations, including the analysis of atypical dispersion events and

any variation in the frequency of such phenomena in order to expand our knowledge of this species and its long-term dynamics.

Acknowledgments

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