

## **Guiana dolphin (*Sotalia guianensis*):**

Summary of review of AquaMaps predictions for WCR undertaken by Kristin Kaschner  
& Randall Reeves, December 2011

### **Revision of AquaMaps predictions based on available regional data (KK)**

This is an only recently recognized sister species of the tucuxi (Caballero et al. 2007), and there were no AquaMaps predictions as such for the Guiana dolphin. However, available AquaMaps predictions for the tucuxi encompass the combined ranges of both the Guiana dolphin, restricted to marine waters, and the exclusively freshwater tucuxi and they match published descriptions of species occurrence fairly well (Borobia et al. 1991, Carr & Bonde 2000, Romero et al. 2001, van Canneyt et al. 2010). I therefore used the envelope settings originally derived for the tucuxi for this species, restricting it to only marine waters. I then modified depth envelope settings of this species based on the information available in da Silva et al. (2010), who concluded that this species is limited to waters < 50 m deep and most sightings have been in waters < 25 m deep<sup>1</sup>. No point data are currently stored in online data repositories, but four of the tucuxi records available through OBIS lie exclusively in marine waters, therefore most likely Guiana dolphins. Based on these, I adjusted the upper limits of the temperature envelope and also derived an upper limit of salinity tolerances to try and capture this species' close association with freshwater/brackish environments. Final input parameter settings can be seen in Table 1 and resulting gradient predictions, generated using the AquaMaps model (Kaschner et al. 2008), are shown in Figure 1. To show the most likely known and probable occurrence of the species in the WCR I applied a presence threshold of 0.6 supported by recent validations for global predictions (Kaschner et al. 2011) (Figure 2).

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<sup>1</sup> Please note that AquaMaps envelopes refer to mean depth of 0.5 degree cells, so envelope settings for very coastal species such as this one need to be broadened a bit, otherwise there will be no cells with suitable habitat left.

Mapping parameters for *Sotalia guianensis* (Guiana dolphin)\_3

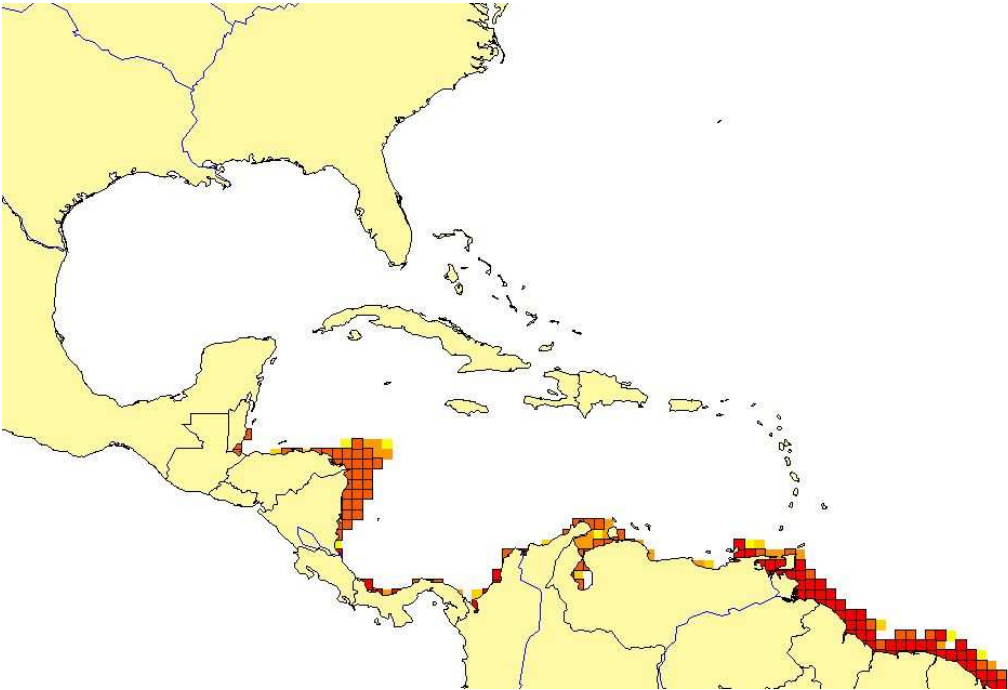
FAOAreas: 41 | 31

Pelagic: False

Bounding Box

(NSWE):	17	-90	-180	180
	Min	Pref Min (10th)	Pref Max (90th)	Max
Depth (m)	0	1	50	100
SST (&deg;C)	20	25	29	30
Salinity (psu)	0	5	35	38

Table 1: AquaMaps input parameter settings for revised map generation



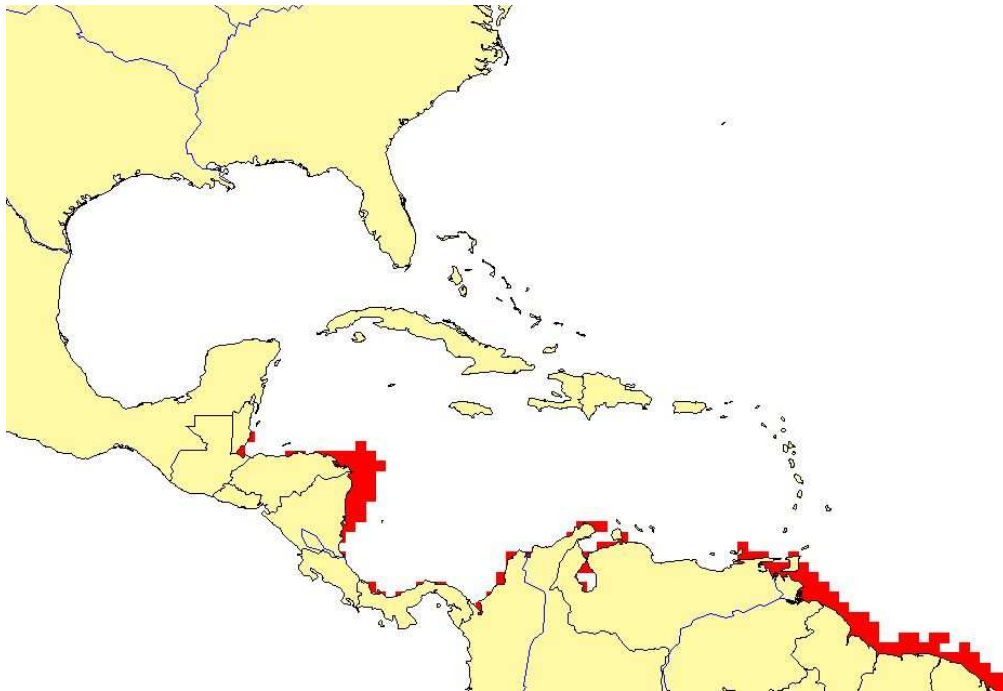
**Fig 1.** Predicted relative habitat suitability based on envelope settings in Table 1. Cells with probability values above the selected threshold are shown with boundaries.

### **Review of outputs by independent expert (Randall Reeves)**

At the IWC SC meeting in 2006 (IWC 2007), range states were identified as including Brazil, Costa Rica, Venezuela, Honduras, Colombia, Suriname and French Guiana – obviously this was not a comprehensive list because it left out at least Nicaragua, Trinidad/Tobago, and Guyana. It was also claimed in the SC report that in Costa Rica occurrence is centered in the mouth of the Sixaola River – “the only part of Costa Rica where the species is found” – and that Guiana dolphins are common in Lake Maracaibo and the Gulf of Venezuela. Although not depicted on the consensus map, the distribution (of *Sotalia*) is apparently continuous from the Atlantic Ocean up the Orinoco River as far as Estado Bolivar and Apure near the mouth of the Suapure River, 800 km from the Orinoco mouth (Da Silva et al. 2010). Some uncertainty remains about the species identity of the dolphins (*guianensis* or *fluviatilis*, or perhaps overlap of the two) in the lower Orinoco. It should also be noted that species experts believe the following (Da Silva et al. 2010): “The distribution of *S. guianensis* is mostly continuous throughout its range .... There is no evidence of large discontinuity, although in some areas it is rarely seen or absent. Furthermore, many parts of its range have never been surveyed.”

Da Silva et al. (2010) concluded that this species is limited to waters < 50 m deep and most sightings have been in waters < 25 m deep. The only area where Guiana dolphins are known to be “non-coastal” is Abrolhos Bank (Brazil) where they occur up to 36 km offshore. This bank is “an extension of the continental shelf with warm and shallow waters” (Da Silva et al. 2010). The offshore bulge in the predicted range off Nicaragua and Honduras on the consensus map is an interesting discrepancy that deserves closer scrutiny, as it could prove to be a second area of “non-coastal” occurrence.

Da Silva et al. (2010) state that Guiana dolphins are “strongly associated with the presence of mangroves and estuarine regions .... The different types of coastal habitats where *S. guianensis* is found include mangrove, dunes, sandy beaches, rocky shores, or a combination of these features, and areas with irregular sea floor relief, and steep and flat bottoms....”



**Fig 2:** Consensus map of known and probable occurrence of species in WCR. No occurrence records currently available through online data repositories.

**Quality of outputs: ★★★★★**

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