

Atlantic spotted dolphin (*Stenella frontalis*):

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)

Mean depth of sightings from line transect surveys in the northern Gulf of Mexico indicated the species occurs mostly on the shelf (Maze-Foley & Mullin 2006). However, based on the analysis of mean depth values of cells associated with high encounter rates of this species (796 available occurrence records from OBIS in 148 cells), occurrences were equally high in depths of up to 500 m and this was therefore assumed to be the upper limit of the species' preferred range. Although there were several observations in cells with mean water depths of up to 5500 m, most other information suggests that this species is mostly confined to much shallower waters; those deep water sightings were therefore considered to be extralimital sightings or species misidentifications (see below). Taking all available information into account, I adjusted the depth envelope to the values summarized in Table 1. I also modified upper limits of the primary production envelope to capture occurrence in areas of very high primary productivity such as around the Mississippi and Amazon river deltas. Density estimates based on available line transect surveys (Davis et al. 1998, Fulling et al. 2003, Mullin & Fulling 2003) and other sources (Perrin et al. 1994) suggested that the species is more common in the eastern than the western part of the Gulf of Mexico, although this is not directly apparent from the available occurrence records in the northern Gulf. This could in part be captured through a small modification of the salinity envelope. 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 as suggested by recent validation analyses (Kaschner et al. 2011) (Figure 2).

Mapping parameters for *Stenella frontalis* (Atlantic spotted dolphin)_3

FAOAreas: 21 | 27 | 31 | 34 | 41 | 47

Pelagic: True

Bounding Box

(NSWE):	90	-90	-180	18
	Min	Pref Min (10th)	Pref Max (90th)	Max

Depth (m)	0	10	500	4000
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SST (°C)	15	20	30	31.02
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Salinity (psu)	32.11	33.33	35.5	38.11
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Primary Production	0	366	2000	6000
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Table 1: AquaMaps input parameter settings for revised map generation

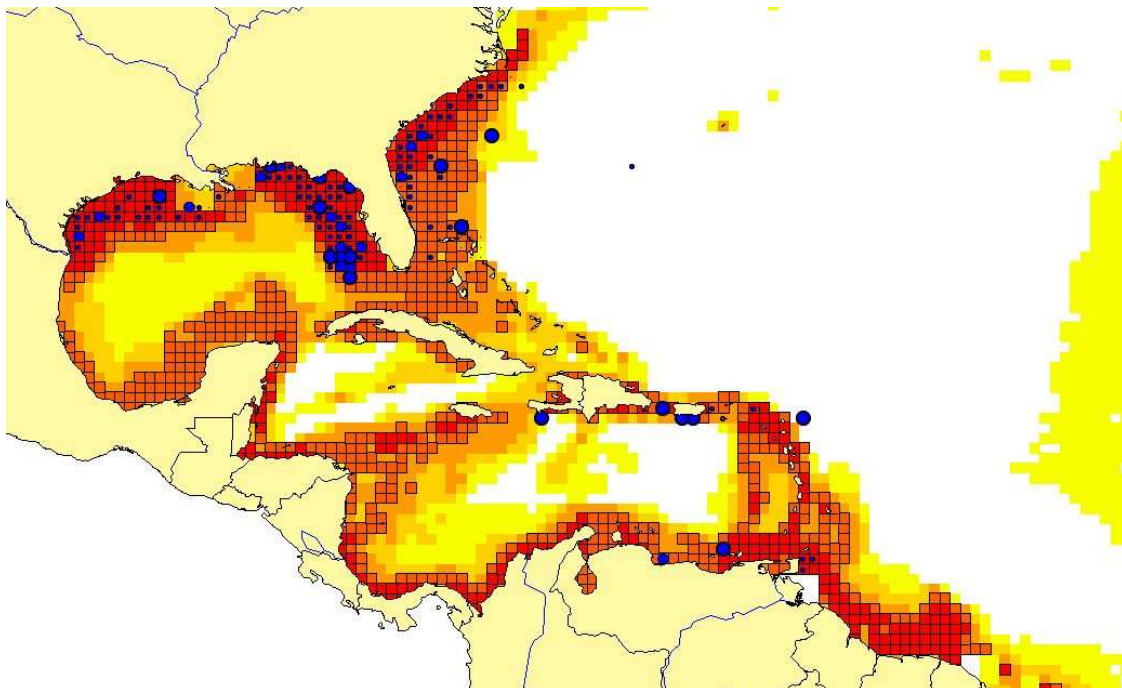


Fig 1. Predicted relative habitat suitability based on envelope settings in Table 1 and calculated relative encounter rates based on available sightings from OBIS (blue). Cells with probability values above the selected threshold are shown with boundaries. *Note that not all occurrences are available/accessible through online data repositories, such as OBIS (www.iobis.org), and records shown on the map do not necessarily represent the whole extent of documented species occurrence! Note also that cells with high encounter rates that lie outside the predicted range (e.g. off Barbuda) are based on single sighting events (as can be seen by comparing with consensus map below which shows sightings

rather than encounter rates) that are considered to be either extralimital or species misidentifications.

Review of outputs by independent expert (Randall Reeves)

Maze-Foley and Mullin (2006) concluded that Atlantic spotted dolphins do not occur in “oceanic” waters of the northern Gulf even though they do in other parts of the Atlantic Ocean, citing oligotrophic conditions offshore and competitive exclusion by pantropical spotted dolphins as possible explanations. Those authors noted a strong association of Atlantic spotted dolphins with the shelf break in the northern Gulf, with the maximum depth for a sighting of 362 m. Perrin et al. (1994) considered this species’ preferred habitat to be “inside or near the 100-fathom [183 m] curve (within 250-350 km of the coast) ... sometimes coming into very shallow water adjacent to the beach seasonally, perhaps in pursuit of migratory forage fish.” Davis et al. (1998) described the preferred habitat of *S. frontalis* in the northern Gulf of Mexico as “shallow water with a gently sloping bottom typical of the continental shelf, although they may also occur along the shelf break and upper continental slope,” adding that their occurrence “in shallow shelf waters may be related to prey preference and foraging strategies.” Overall and in general, the predictions for the WCR on the consensus map look reasonable.

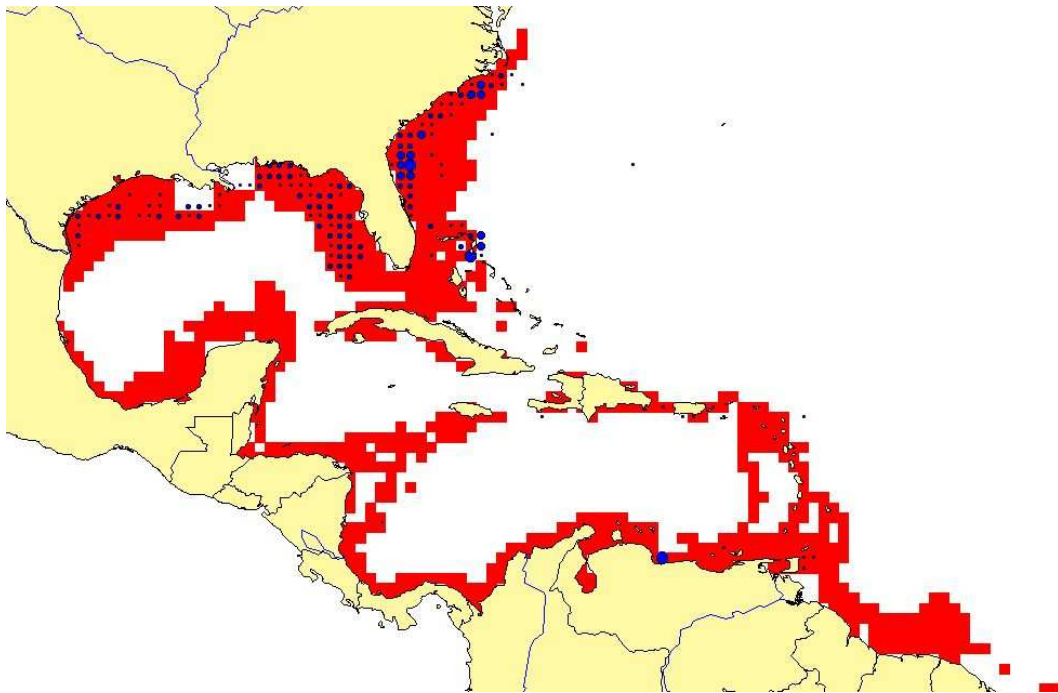


Fig 2. Consensus map of known and probable occurrence of species in WCR plus sightings available through OBIS shown in blue. *Note that not all occurrences are available/accessible through online data repositories, such as OBIS (www.iobis.org), and records shown on the map do not necessarily represent the whole extent of documented species occurrence!

Quality of outputs: ★★ ★

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