Common bottlenose dolphin (*Tursiops truncatus*):

Summary of review of AquaMaps predictions for WCR undertaken by Kristin Kaschner & Randall Reeves, December 2011-12-08

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

Using the 13,000 species occurrence records available through OBIS for the study area, I computed relative encounter rates of the species by calculating the proportion of total sighting events of this species in each of the 266 half degree "presence cells". An analysis of mean depth values associated with cells in which relative encounter rates were high showed the species in this area was concentrated in comparatively shallower waters than described by the original global depth envelope range. This was further corroborated by the gradient in observed densities from northern Gulf of Mexico line transect surveys as well as various published analyses of mean depth of sightings (Davis et al. 1998, Baumgartner et al. 2001, Maze-Foley & Mullin 2006) and I therefore adjusted the depth envelope accordingly. Available literature about habitat usage of the species in this region did not suggest regional temperature or other environmental ranges diverged from the global mean envelopes, so these were not changed. 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 representation of 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).

Mapping parameters for Tursiops truncatus (bottlenose dolphin)

FAOAreas: 21 | 27 | 31 | 34 | 37 | 41 | 47 | 51 | 57 | 58 | 61 | 67 | 71 | 77 | 81 | 87

Pelagic: True

Bounding Box (NSWE):	90	-90	-180	180
	Min	Pref Min (10th)	Pref Max (90th)	Max
Depth (m)	0	10	400	5000
SST (°C)	5	12.82	28.26	32.46
Salinity (psu)	5.61	32.74	35.95	40
Primary Production	0	333	1456	3235

Table 1: AquaMaps input parameter settings for revised map generation

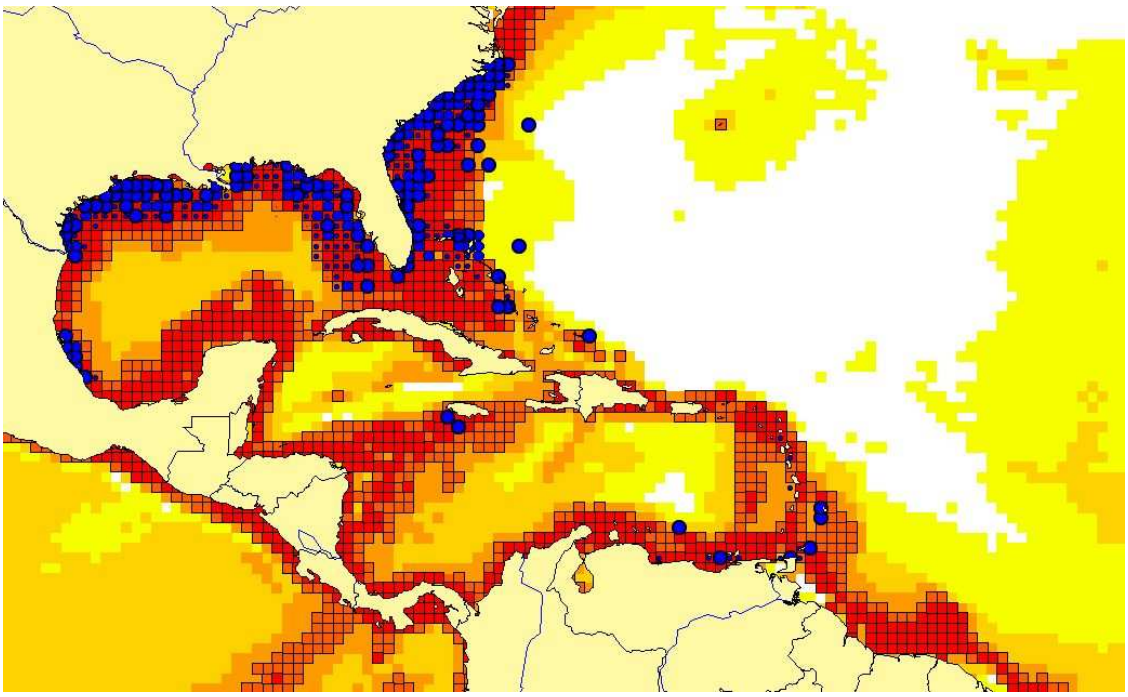

Fig 1. Predicted relative habitat suitability based on envelope settings in Table 1 and calculated relative encounter rates based on available sightings from OBIS (blue). Cells with probability values above the selected threshold are shown with boundaries. *Note that not all occurrences are available/accessible 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!

Review of outputs by independent experts (Randall Reeves et al.)

The experts consulted in Tampa – John Reynolds, Keith Mullin, and Patricia Rosel – considered the KK map of bottlenose dolphin distribution to be a good and reasonable representation of what is known and what would be predicted based on likely suitable habitat outside well-surveyed areas. The environmental envelope determined by KK was judged to be sensible. Although the closely related Indo-Pacific bottlenose dolphin (*Tursiops aduncus*) does not occur in the WCR, there is real uncertainty about the taxonomy of bottlenose dolphins along the Atlantic coast of the USA, and the possibility that multiple *Tursiops* taxa (subspecies or even species) occur in the WCR cannot be ruled out. Nicole Vollmer's PhD work should help clarify this (also see Vollmer and Rosel 2011). At least two ecotypes or morphotypes of *Tursiops* occur in the Gulf of Mexico, and likely also much or most of the Caribbean Sea. Rosel suggested that there may be a gap in high-density occurrence of *Tursiops* in the middle of the Straits of Florida where deep water and strong currents prevail (but this is speculative). Bottlenose dolphins occur not only in near-shore coastal waters throughout much of the WCR but also in lagoons and channels inside barrier islands, including brackish waters, and this appears to be fairly well reflected in the consensus map. Rosel pointed out that although the "blank" areas in deep offshore waters of both the Gulf of Mexico and the Caribbean are probably real (i.e. bottlenose dolphins are either absent or infrequent there), areas around offshore islands or over seamounts should be considered likely habitat for the species even if no surveys have been conducted there.

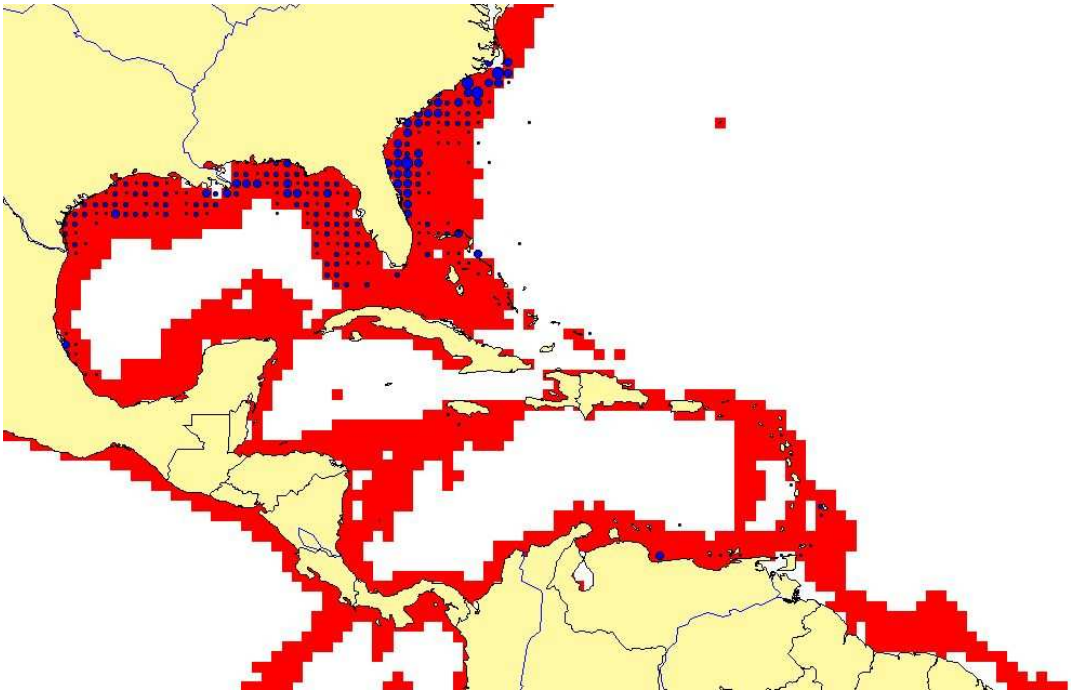

Fig 2. Consensus map of known and probable occurrence of species in the WCR (including available sightings from OBIS (blue)). *Note that not all occurrences are available/accessible through online data repositories, such as OBIS (www.iobis.org), and records shown on the map do not necessarily represent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

Quality of outputs: ★★★★

References

Baumgartner MF, Mullin KD, May LN, Leming TD (2001) Cetacean habitats in the Northern Gulf of Mexico. Fishery Bulletin 99:219-239

Davis RW, Fargion GS, May N, Leming TD, Baumgartner MF, Evans WE, Hansen LJ, Mullin KD (1998) Physical habitat of cetaceans along the continental slope in the northcentral and Western Gulf of Mexico. Marine Mammal Science 14:490-507

Kaschner K, Ready JS, Agbayani E, Rius J, Kesner-Reyes K, Eastwood PD, South AB, Kullander SO, Rees T, Close CH, Watson R, Pauly D, Froese R (2008) AquaMaps: Predicted range maps for aquatic species. World wide web electronic publication, www.aquamaps.org, Version 08/2010

Kaschner K, Tittensor DP, Ready J, Gerrodette T, Worm B (2011) Current and future patterns of global marine mammal biodiversity. Plos One 6:e19653

Maze-Foley K, Mullin KD (2006) Cetaceans of the oceanic northern Gulf of Mexico: Distributions, group sizes and interspecific associations. Journal of Cetacean Research and Management 8:203-213

Vollmer NL, Rosel PE (2011) The use of single nucleotide polymorphisms to discriminate populations of bottlenose dolphins (*Tursiops truncatus*) in the Gulf of Mexico. Abstracts, 19th Biennial Conf. Biol. Mar. Mammals, Tampa, FL, 27 Nov-2 Dec 2011