

Fraser's dolphin (*Lagenodelphis hosei*):

Summary of review of AquaMaps predictions for WCR undertaken by Kristin Kaschner
& Randall Reeves, February 2012

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

Mean depth of the 3 sightings from line transect surveys in the northern Gulf of Mexico indicated the species occurs mostly in deep offshore waters (Maze-Foley & Mullin 2006). This was supported by the analysis of mean depth values for the 5 cells of the 6 occurrence records available from OBIS. Published regional habitat use information also suggests that this is a primarily oceanic species, occurring near shore only in areas where deep water is close to land (Jefferson & Schiro 1997). Fraser's dolphin is considered a tropical, warm water species, although there are a few records from warm temperate waters (Jefferson & Schiro 1997, Mignucci-Giannoni et al. 1999). I therefore only made a small adjustment of the default temperature to emphasize the regular documented occurrence of the species around the Caribbean from which, by the 1990s, more than a third of all known records of the species in the Atlantic had come (Mignucci-Giannoni et al. 1999). 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 represent the known and probable occurrence in the WCR I applied a presence threshold of 0.6 as suggested by recent validation analyses (Kaschner et al. 2011).

The predicted distribution matches the very limited known and documented occurrence of this species quite well (Ward et al. 2001). Strandings have been reported from islands throughout the Caribbean for a long time (Mignucci-Giannoni et al. 1999), while the first reported sightings in the northern Gulf of Mexico date back to only the early 1990s when the first deep water GulfCet cruises took place (Jefferson & Schiro 1997). It's also noteworthy that there is at least one documented stranding from the Dutch Leeward islands (Bonaire) (Debrot et al. 2011), which is not mentioned by Ward et al (2001), but matches predicted occurrence in the area.

Mapping parameters for *Lagenodelphis hosei* (Fraser's dolphin)_3

FAO Areas: 21 | 27 | 31 | 34 | 41 | 47 | 51 | 57 | 61 | 71 | 77 | 81 | 87

Pelagic: True

Bounding Box (NSWE):	90	-90	-180	180
	Min	Pref Min (10th)	Pref Max (90th)	Max
Depth (m)	0	500	3000	6000
SST (°C)	15	26	27	30
Salinity (psu)	30	34.03	35.41	37
Primary Production	0	300	700	2000

Table 1: AquaMaps input parameter settings for revised map generation

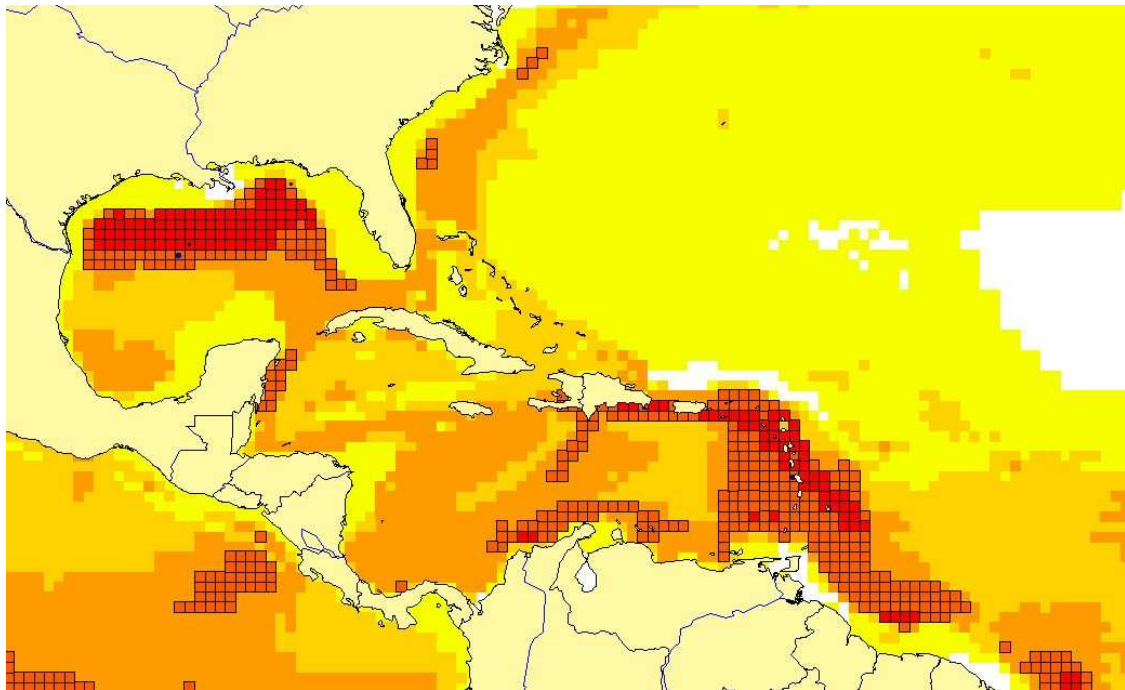


Fig 1. Predicted relative habitat suitability based on envelope settings in Table 1 and calculated relative encounter rates based on available sightings from OBIS (blue). Cells with probability values above the selected threshold are shown with boundaries. *Note that not all records of occurrence are available/accessible through online data repositories, such as OBIS (www.iobis.org), and therefore the records shown on the map do not necessarily represent the whole extent of documented species occurrence.

Review of outputs by independent expert (Randall Reeves)

This pantropical species has been found to have a broad and continuous distribution in the eastern tropical Pacific where it is associated with upwelling-modified waters (Jefferson & Leatherwood 1994, Perrin et al. 1994) and it may be more widely distributed in the WCR than available records suggest. However, the infrequency of sightings in deep offshore waters of the northern Gulf of Mexico suggest Fraser's dolphins are truly rare there (Maze-Foley and Mullin 2006 report only three sightings).

It is of particular interest that Fraser's dolphins have been seen relatively often in boat-based surveys off Guadeloupe (56 "encounters" from 1999-2005), sometimes in association with pantropical spotted dolphins (Rinaldi et al. 2006).

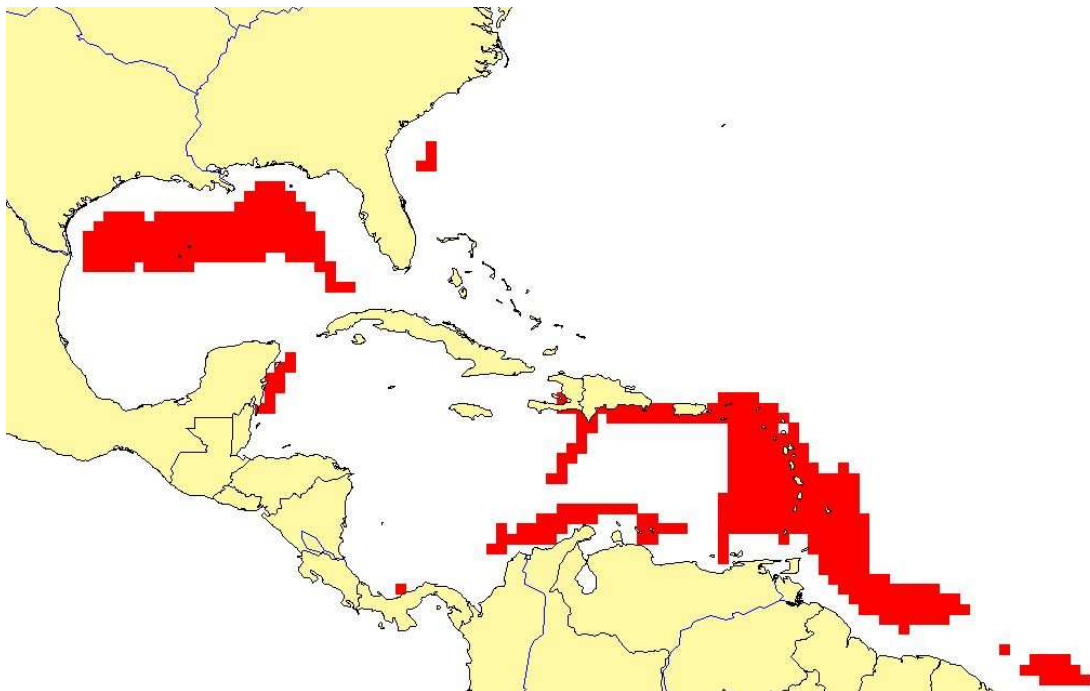


Fig 2. Consensus map of known and probable occurrence of species in the WCR (including available sightings from OBIS (blue)). *Note that not all records of occurrence are available/accessible through online data repositories, such as OBIS (www.iobis.org), and therefore the records shown on the map do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

Quality of outputs: ★★

References

- Debrot AO, Witte RH, Scheidat M, Lucke K, Adolphe O. Debrot RHW, Meike Scheidat and, Lucke K (2011) A Proposal towards a Dutch Caribbean marine mammal sanctuary, IMARES Wageningen UR
- Jefferson TA, Leatherwood S (1994) *Lagenodelphis hosei*. Mammalian Species 470:1-5
- Jefferson TA, Schiro AJ (1997) Distribution of cetaceans in the offshore Gulf of Mexico. Mammal Review 27:27-50
- 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
- Mignucci-Giannoni AA, Montoya-Ospina RA, Perez-Zayas JJ, Rodriguez-Lopez MA, Williams EHJ (1999) New records of Fraser's dolphin (*Lagenodelphis hosei*) for the Caribbean. Aquatic Mammals 25:15-19
- Perrin WF, Leatherwood S, Collet A (1994) Fraser's dolphin, *Lagenodelphis hosei* (Fraser, 1956). In: Ridgway SH, Harrison RJ (eds) The First Book of Dolphins - Handbook of Marine Mammals, Vol 5. Academic Press, San Diego, p 225-240
- Rinaldi C, Rinaldi R, Sahagian P (2006) Report of surveys conducted on small cetaceans off Guadeloupe 1998 to 2005 (SC/58/SM17) International Whaling Commission - Scientific Committee Meeting. (unpublished), p 4
- Ward N, Moscrop A, Carlson CA (2001) Elements for the development of a marine mammal action plan for the wider Caribbean: A review of marine mammal distribution First Meeting of the Contracting Parties (COP) to the Protocol Concerning Specially Protected Areas and Wildlife (SPA) in the Wider Caribbean Region. United Nations Environment Programme, Havana, Cuba, 24-25 September 2001, p 83