Received: 13 October 2015

IOTC–2015–WPTT17–41

SEYCHELLES AUXILIARY VESSELS IN SUPPORT OF PURSE SEINE FISHING IN THE INDIAN OCEAN DURING 2005-2014: SUMMARY OF A DECADE OF MONITORING

Assan C[1], Lucas J[1], Augustin E[1], Delgado de Molina[2], Maufroy A[3], Chassot E[4]

SUMMARY

KEYWORDS: Purse seining, FAD, fishing effort

[1] Seychelles Fishing Authority, Fishing Port, Victoria, SEYCHELLES. Contact: cassan@sfa.sc
[2] Instituto Espanol de Oceanografia, , PO Box 1373, S/C Tenerife, SPAIN
[3] Institut de Recherche pour le Développement, UMR 248 MARBEC, Avenue Jean Monnet, 34203 Sète Cedex, FRANCE
[4] IRD, SFA, Fishing Port, BP570, Victoria, SEYCHELLES

1. Introduction

Support vessels, also called supply or auxiliary vessels, play a major role in tropical tuna purse seine fisheries worldwide (ISSF 2012), with the exception of the eastern Pacific Ocean where they have been banned to operate in 1998 (IATTC 1999). Support vessels are vessels that are not equipped with any fishing gear but assist one or several purse seiners in the detection of tuna schools and the management of the stock of artificial fish aggregating devices (FADs) and buoys used to locate both natural floating objects (LOGs) and FADs. In addition to GPS, most buoys now include echo-sounder devices that provide information on the biomass of tuna aggregated under the equipped objects (Chassot et al. 2014; Lopez et al. 2014). More specifically, activities of support vessels related to fishing include the building and deployment of FADs, the visit of LOGs and FADs, the transfer of buoys, and the retrieval of FADs and buoys. In addition, support vessels also contribute to increasing the fishing time of the purse seiners they assist through the transport of persons and materials and repairing operations (Arrizabalaga et al. 2001).

In the Indian Ocean, the first support vessels appeared in the late 1980s to act as anchored FADs on the Travin Bank (or seamount 'Coco de Mer'), enhancing the aggregation of tunas through powerful flashlights (Marsac et al. 2014). Although some 'navigating' support vessels may have become active from the mid-1990s, information on the number and activities of support vessels has only become available with the implementation of a moratorium on FAD-fishing in the Western Indian Ocean during November 1998 – January 1999. Hence, information on the activities of support vessels was first collected through observer data (Arrizabalaga and Artetxe 2000, Arrizabalaga et al. 2001, Artetxe and Arrizabalaga 2002, Mina et al. 2002). Such data allowed a comprehensive description of the short term operations and tactics of support vessels and of the materials they used in the late 1990s. Following the IOTC Resolution 01/05, logbooks were implemented on support vessels in late 2004 (Delgado de Molina et al. 2004). While they were first found to vary in terms of the quantity and quality of information reported, the reporting rate of logbooks steadily increased throughout the 2000s to reach >90% in 2010 (Ramos et al. 2010). Logbook data collected aboard support vessels then cover a long period of time through the whole year and provide a lot of information on the effort and activities this component of the purse seine fleet (Sarralde et al. 2007, Ramos et al. 2010).

Here, we describe the main characteristics of the Seychelles support vessel fleet and provide a synthesis of the activities of support vessels during 2005-2014. Our objective is to quantify the contribution of the support vessels to the overall nominal effort of the purse seine fleet and show the main changes that may have occurred in the fleet over the last decade.

2. Materials

2.1 AVDTH database for 2005-2014

All logbook data were first entered in a MS ACCESS database dedicated for the support vessels (Sarralde et al. 2007). Following the extension of the software AVDTH (Acquisition et Validation des Données de Pêche au Thon Tropical; Lechauve 1998) to include all activities related to the activities on FADs and buoys added in the logbooks of the French purse seine fleet in 2013, all logbook data from Seychelles support vessels were migrated to a specific AVDTH database. The full dataset covers the period from early November 2004 to nowadays and is restricted here to the period 2005-2014 for consistency reason. Overall, more than 35,000 activities were reported in the logbooks for 12 distinct vessels that operated a total of 334 fishing trips during 2005-2014. The trip duration greatly varied between vessels, from a minimum of 3 to a maximum of 135 d, with a median of about 40 days at sea.

2.2 Characteristics of the support vessels

While first support vessels were mostly old pole and liners or trawlers reconverted for conducting the activities required for assisting purse seine fishing, specific designs have been developed in the recent years and brand new support vessels are now built in Spanish shipyards. Based on the initial year of service available for each vessel, we computed the mean age of the Seychelles support vessels to investigate for some changes in the overall strategy of the purse seine fishing companies operating in the Indian Ocean. Also, Seychelles support vessels were characterised by their average length and engine power to look for changes in the fleet over the last decade.

2.3 Supply vessels operations

3. Results

Acknowledgments. We are grateful to Javier Ariz, Pilar Pallarés, Roberto Sarralde, and all past and current personnel involved in the collection and management of logbook data on support vessels. We are particularly grateful to the skippers and captains involved in data reporting as well as ANABAC and OPAGAC for fruitful collaboration for the monitoring of the purse seine fleet in the Indian Ocean. We thank the MCS section of SFA for the collection of logbooks and the staff of the Observatoire Thonier (IRD) for maintaining the AVDTH database used for data management.

4. References

Figures

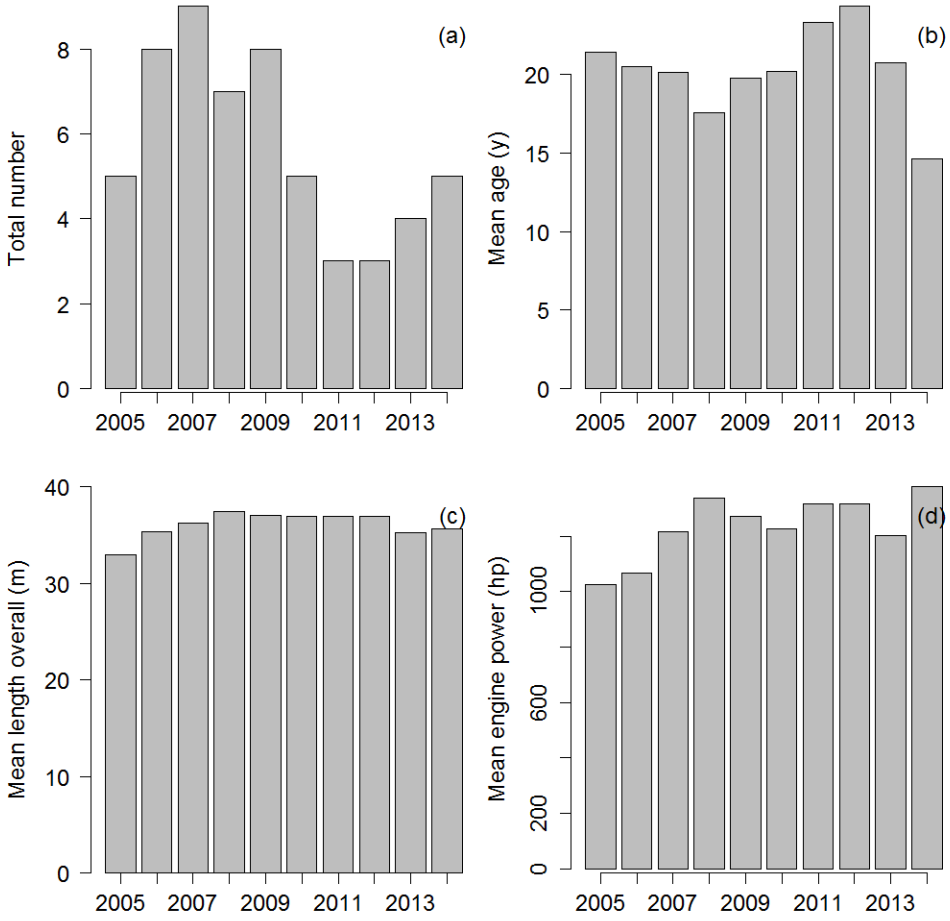

Fig. 1. Yearly main characteristics of the Seychelles support vessel fleet during 2004-2015: (a) Total number of vessels in operation, (b) Mean age of the vessels, (c) Mean length overall, (d) Mean engine power

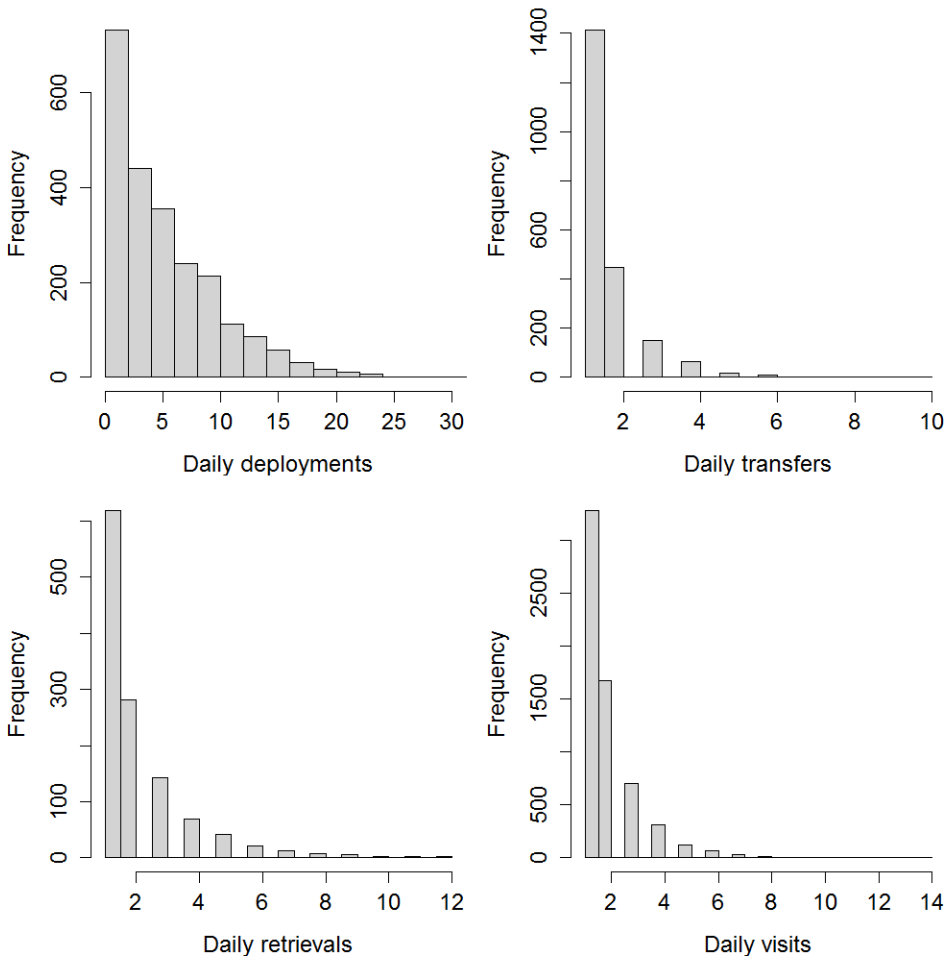

Fig. 2. Histograms of the principal operations related to fishing performed by Seychelles support vessels during 2004-2015: (a) Daily deployments of FADs at sea, (b) Daily transfers of buoys on FOBs, (c) Daily retrievals of FADs from the water and (d) Daily visits of FOBs.

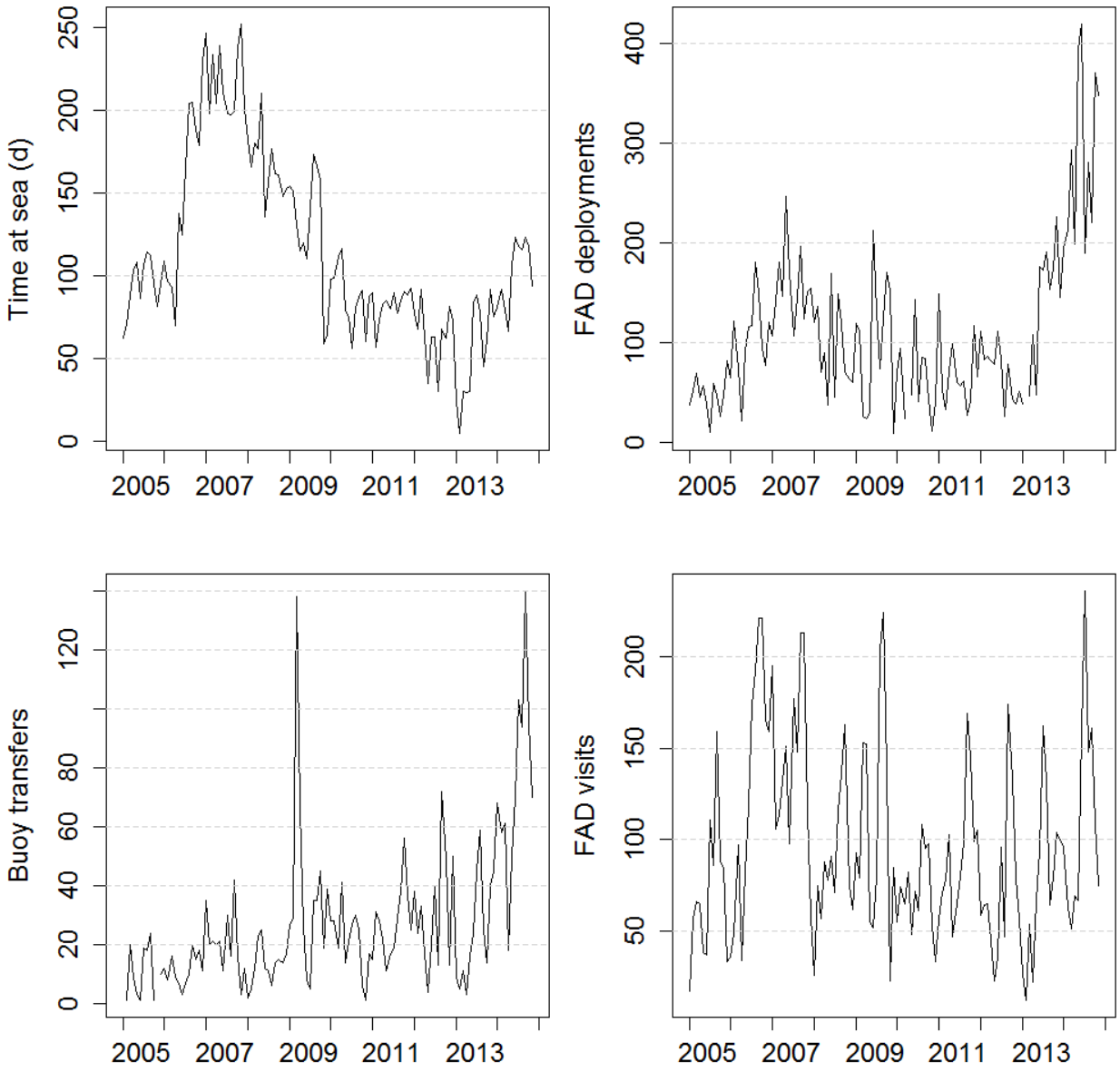

Fig. 3. Monthly time series of the principal operations related to fishing performed by Seychelles support vessels during 2004-2015: (a) Total time at sea in days (b) Total monthly deployments of FADs at sea, (c) Total transfers of buoys on FOBs, (d) Daily visits of FOBs. The data exclude the support vessel anchored on the Travin Bank

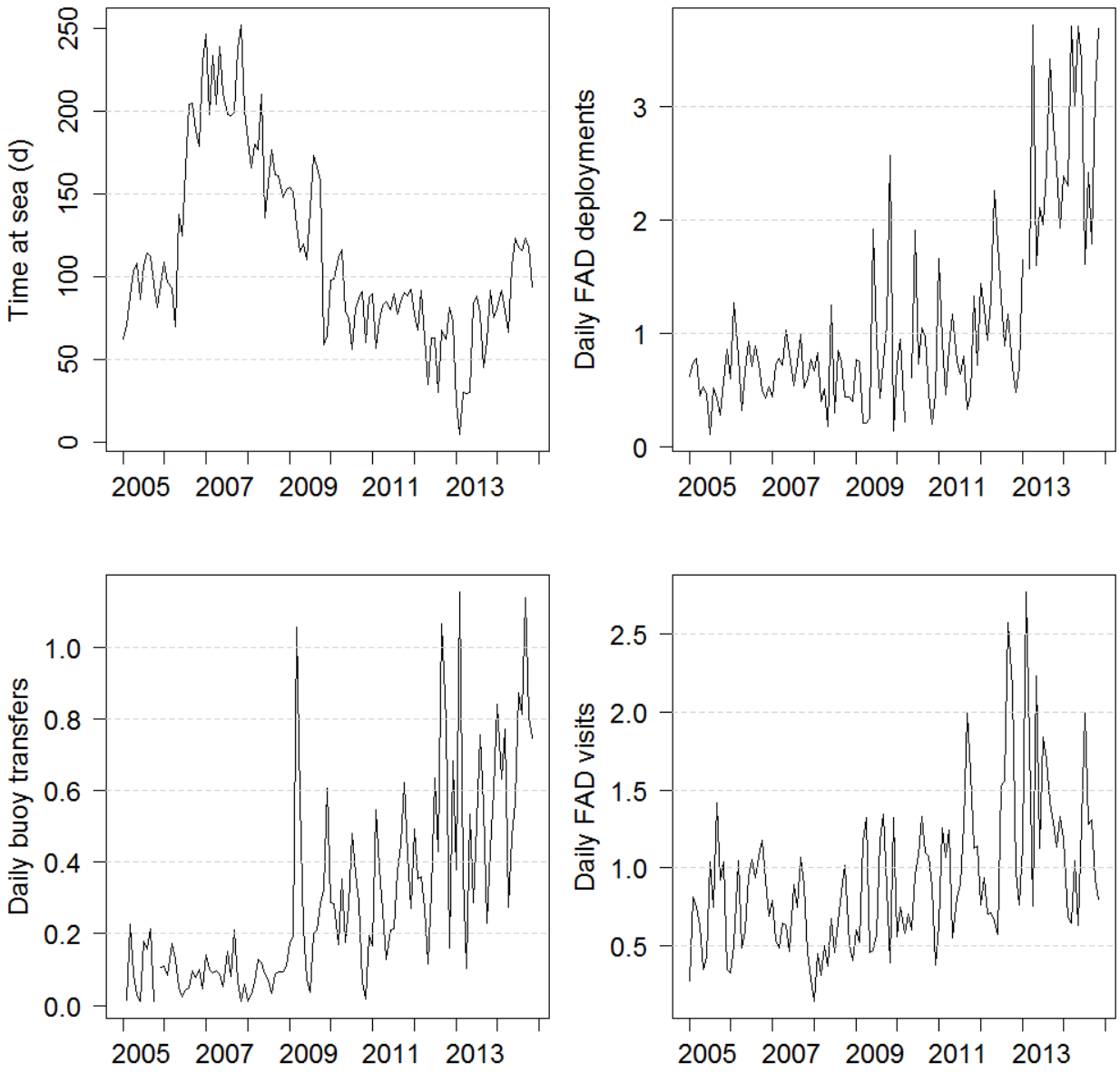

Fig. 4. Monthly standardised time series of the principal operations related to fishing performed by Seychelles support vessels during 2004-2015: (a) Total time at sea in days (b) Daily rates of deployments of FADs at sea, (c) Daily rates of transfers of buoys on FOBs, (d) Daily rates of visits of FOBs. The data exclude the support vessel anchored on the Travin Bank

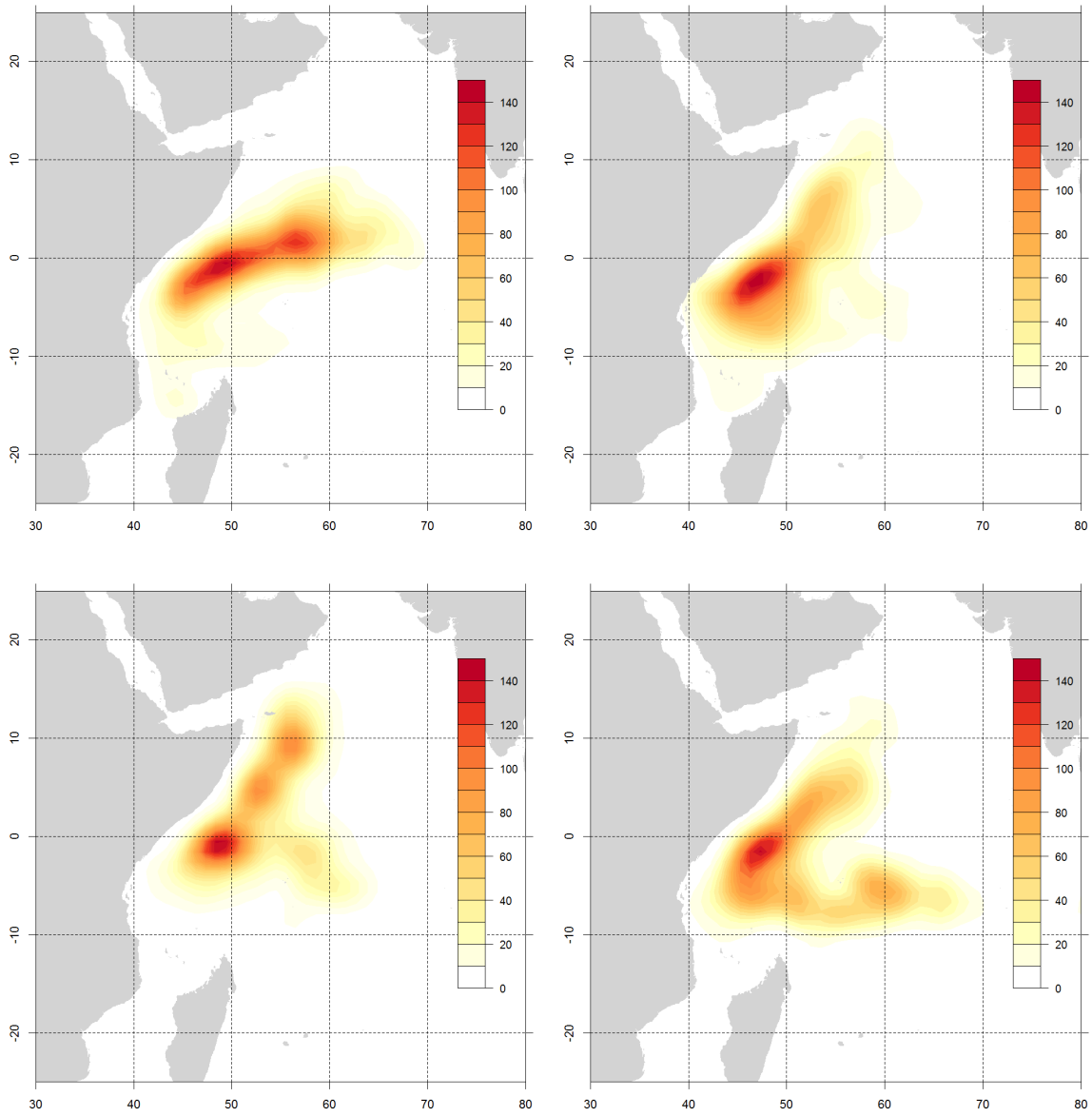

Fig. 5. Quarterly maps of density of deployments of FADs at sea by Seychelles support vessels during 2004-2015: (a) January-March, (b) April-June, (c) July-September, (d) October-December