

IAIA 2015

IMPACT ASSESSMENT IN THE DIGITAL ERA

Offshore drilling operations and fishery monitoring programs: a quantitative impact assessment experience in Southern Bahia, Northeast of Brazil.

Rodrigo de Oliveira Campos¹

Cristiano Gil Dapper¹

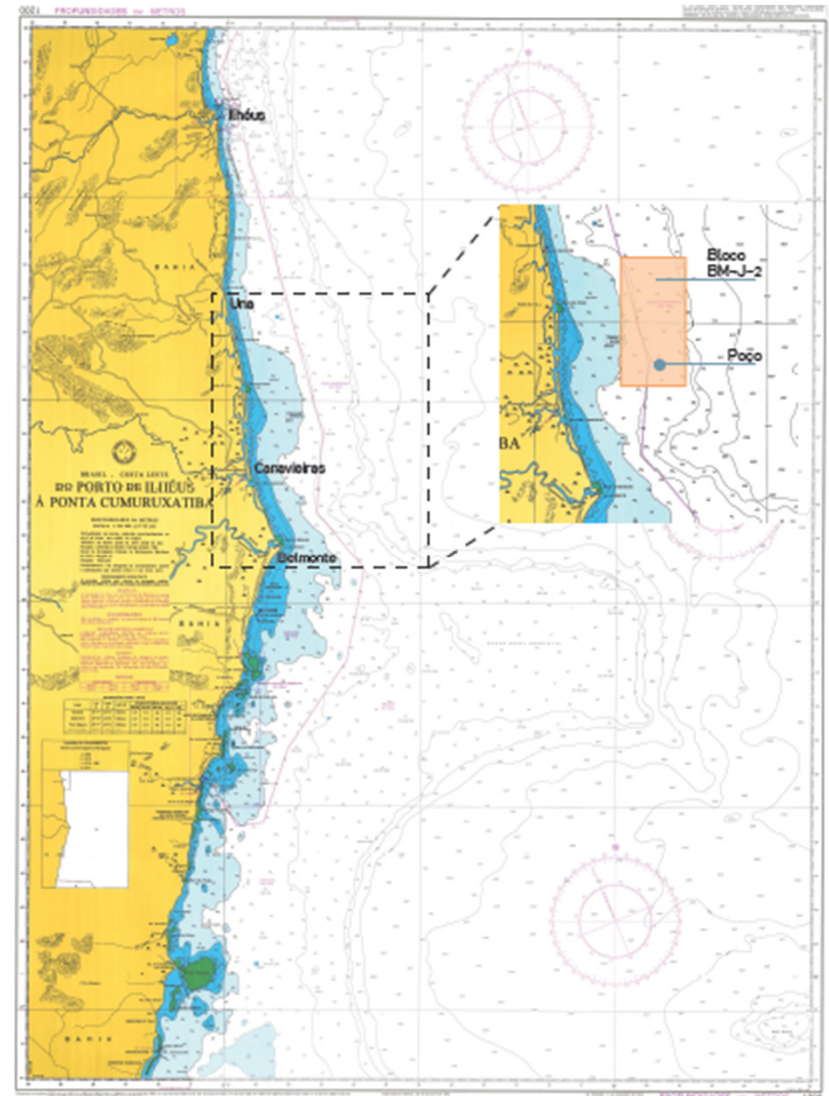
Maria Eduarda Pessoa²

Thays Amaro²

¹- *Private Consultant*

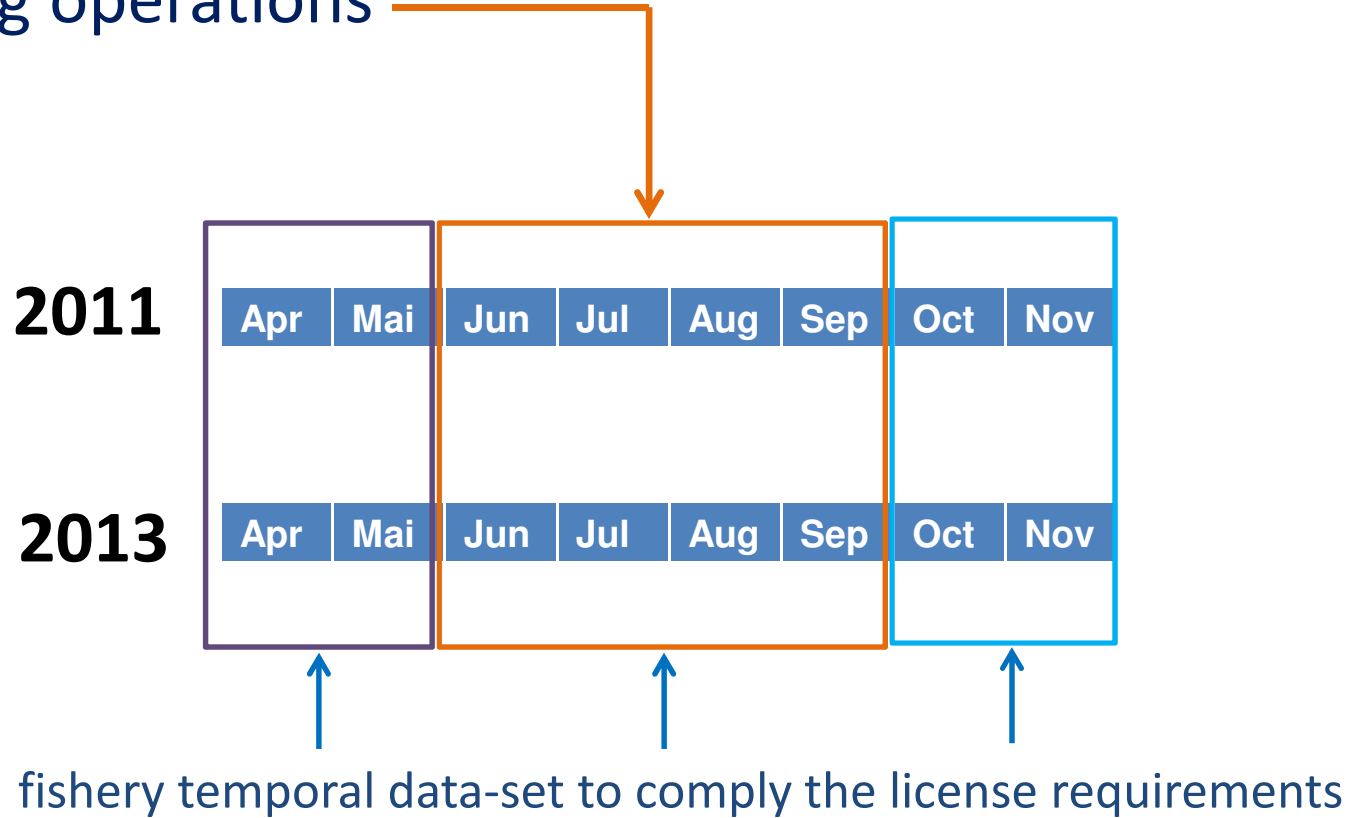
²- *Queiroz Galvão Exploração e Produção - QGEP*

- Offshore drilling operations on shallow waters in Southern Bahia
- Tropical small-scale fisheries



- Guidelines by the Brazilian Oil and Gas General Coordination-CGPEG
- Compliance by “Queiroz Galvão Exploração e Produção” company

- Drilling operations

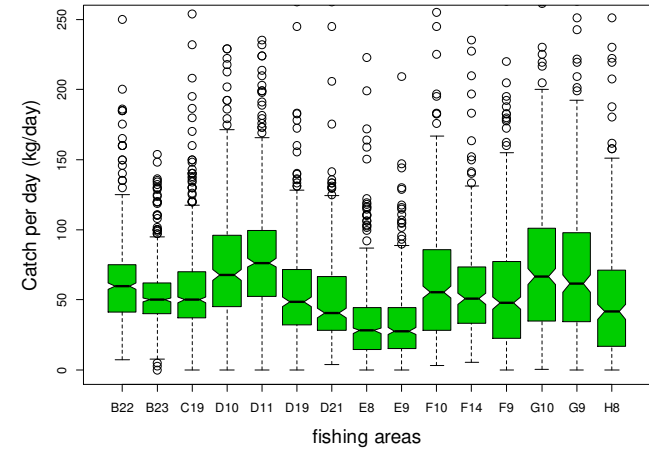


- Fishery monitoring program
(carried out from April/2011 to December/2013)

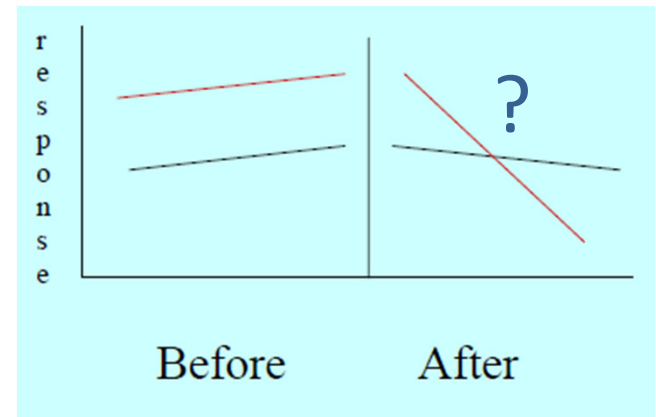
- Catch-effort data
 - Fishery landings
 - Randomly sampling
 - Training course for local collectors



- Exploratory Data Analysis
 - Descriptive and inferential statistics
 - Spatial-temporal fisheries dynamics



- Analytical approach for IA
 - Before-After Control-Impact design (BACI) and Analysis of Covariance (ANCOVA)



BEFORE

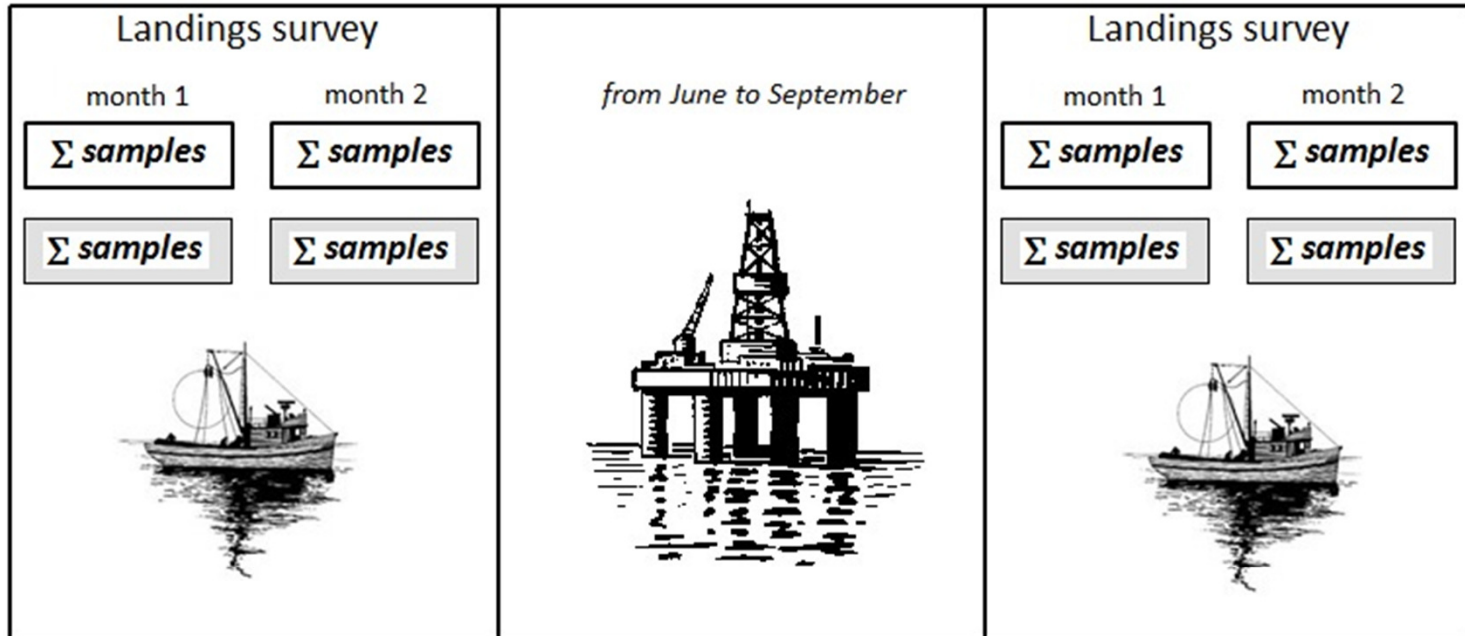
DRILLING

AFTER

2011

 CONTROL

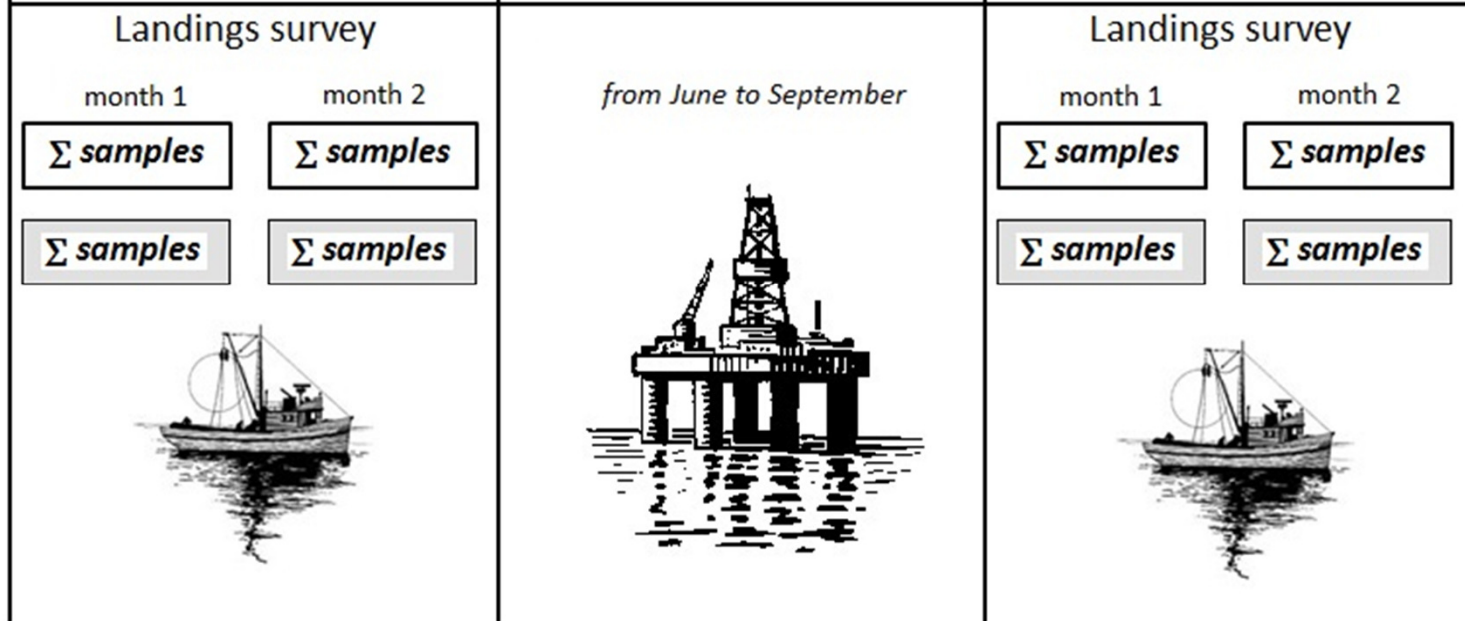
 IMPACT

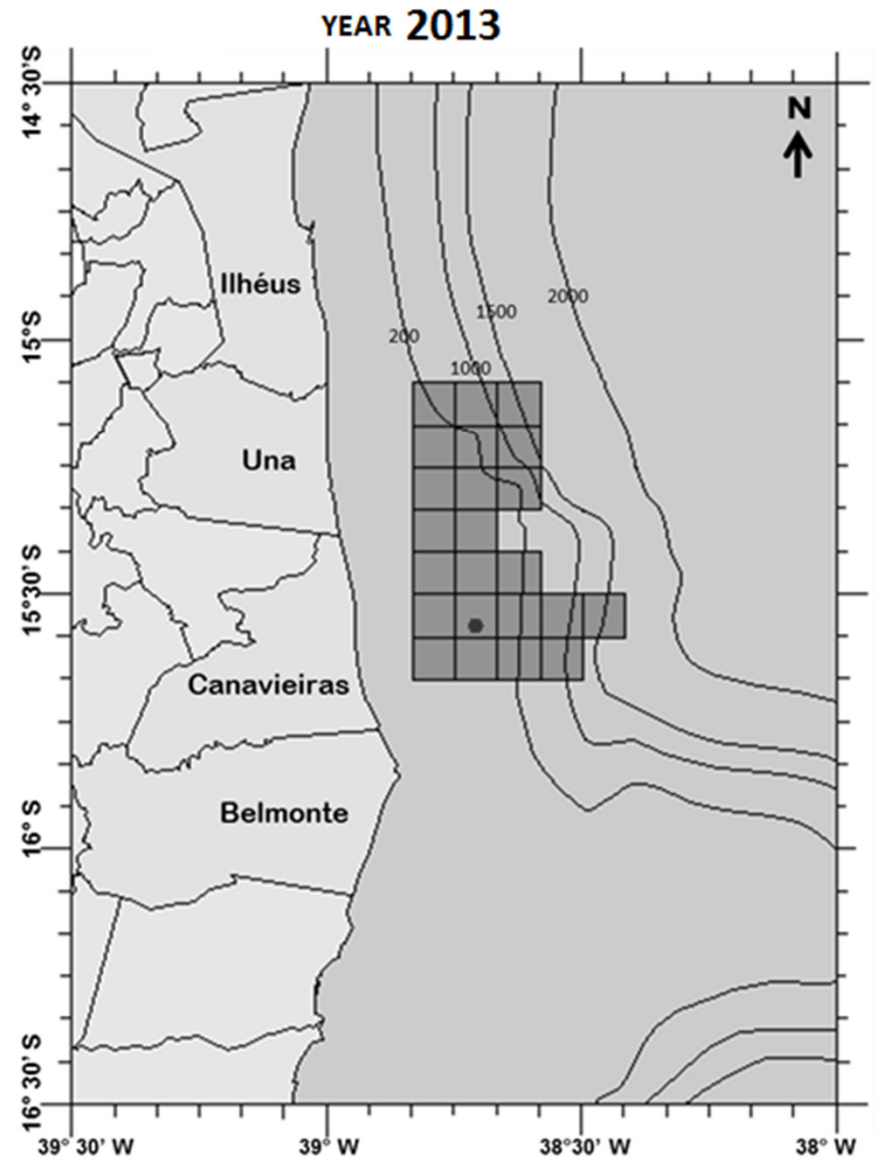
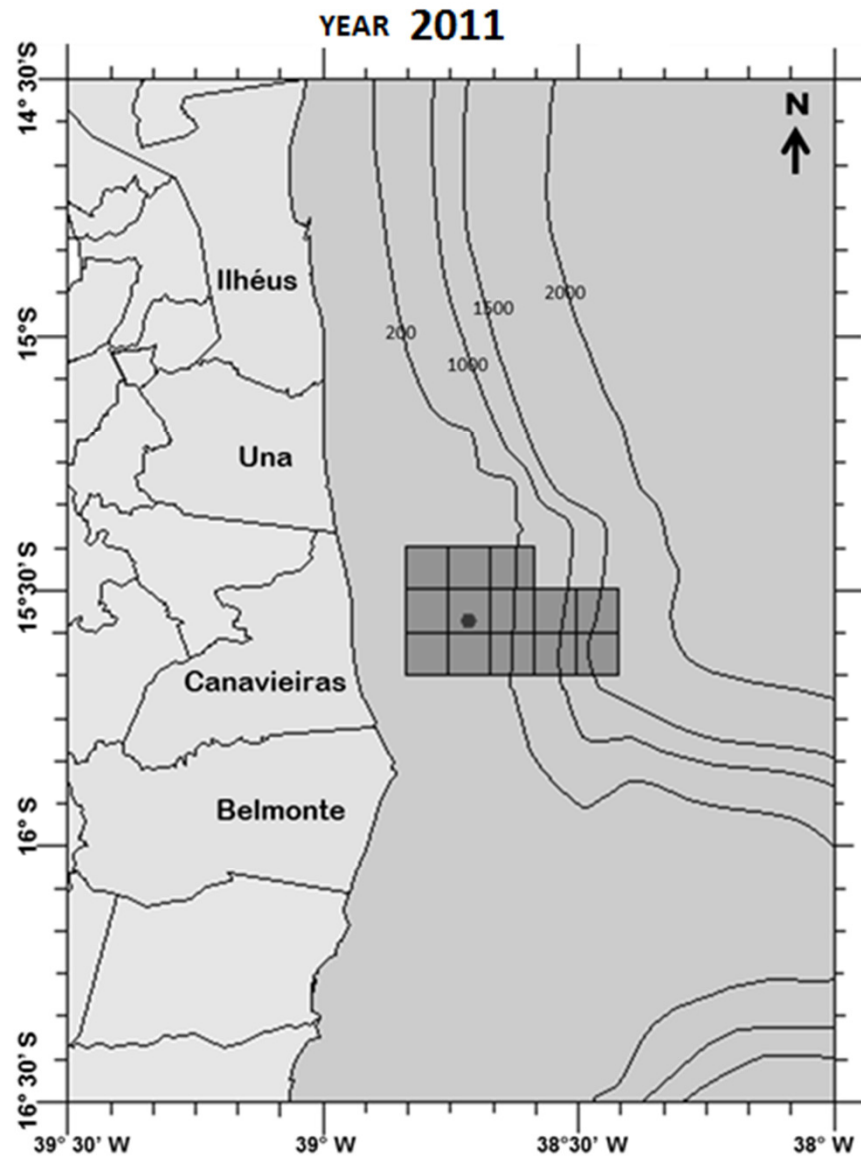


2013

 CONTROL

 IMPACT





0 10 20 Nautical Miles

■ IMPACT ■ CONTROL

✓ The model applied can be described as:

$$\mathbf{Catch} = \boldsymbol{\mu} + \mathbf{Effort} + \mathbf{Period} + \mathbf{Area} + \mathbf{Interactions} + \boldsymbol{\varepsilon}$$

Where:

Catch: aggregated catch per landing in kg for each period and area;

μ : population mean;

Effort: aggregated fishing effort in days-at-sea for each period and area;

Period: period of sampling “Before” or “After” the drilling operations for each year;

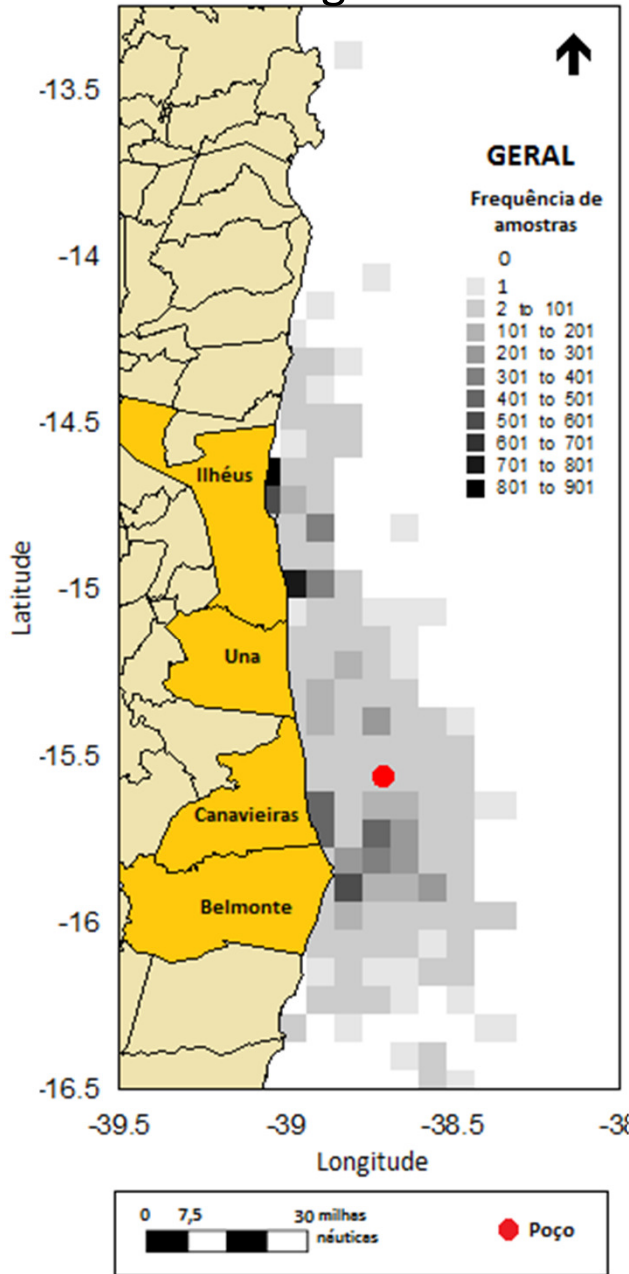
Area: defined areas as “Control” or “Impact” according to the drilling operations/supply vessel movements for each year;

Interações: interaction between the factors (Period and Area);

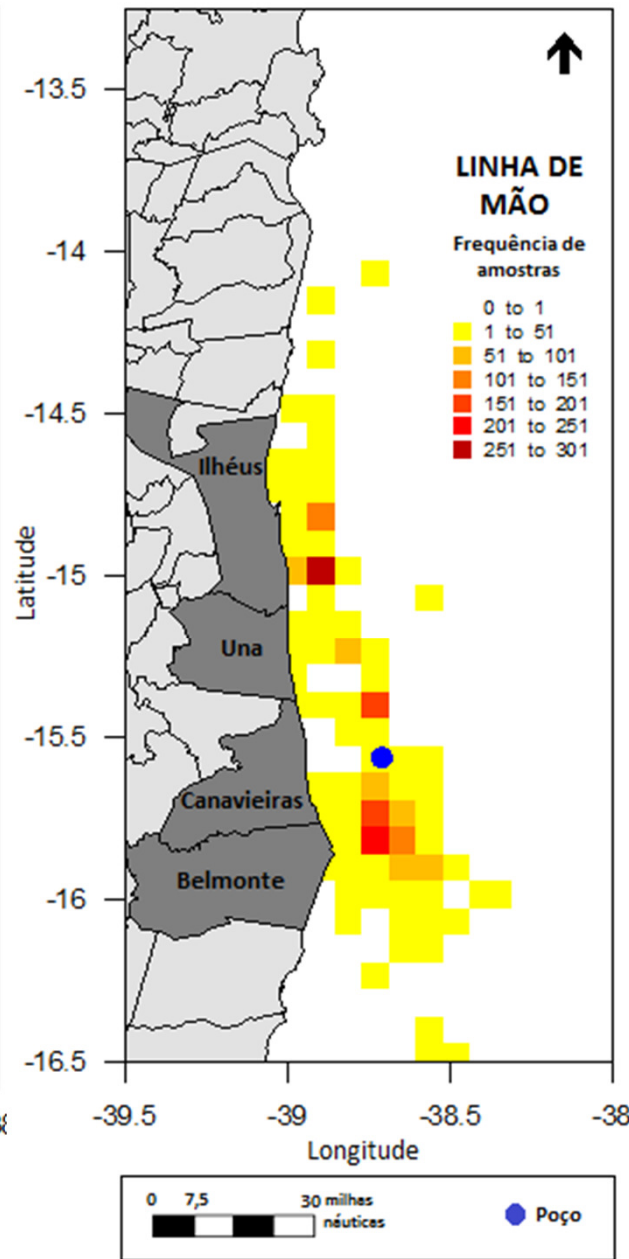
ε : random error.

Frenquency of samples

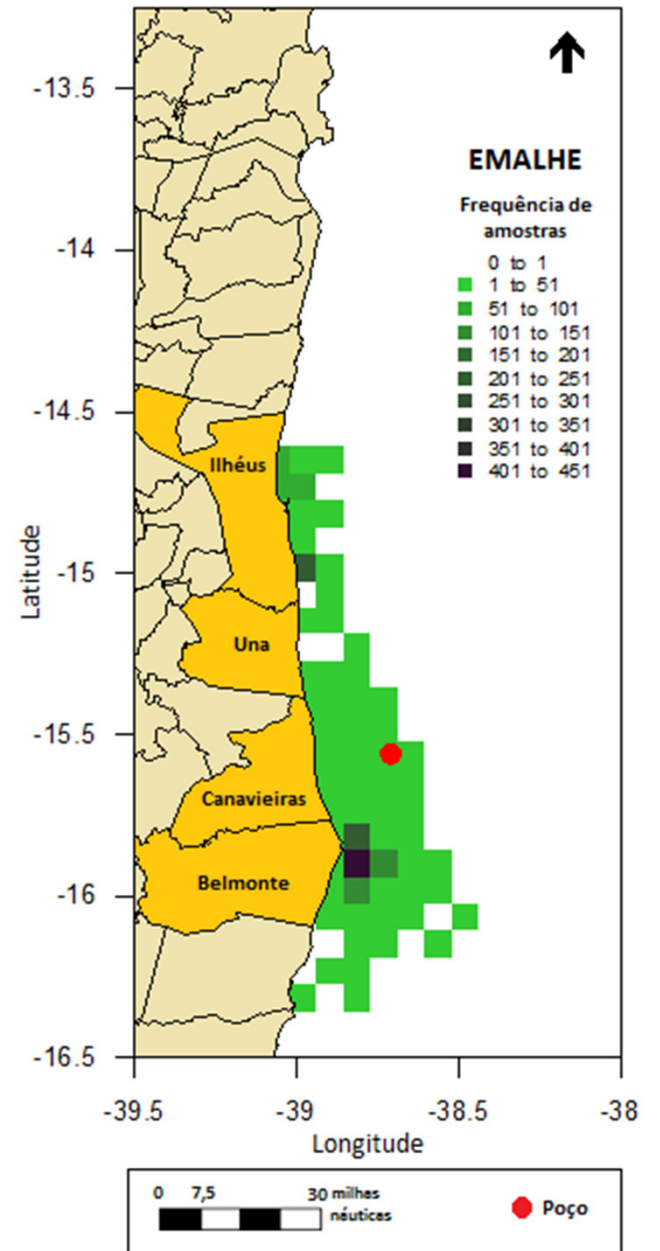
All gears



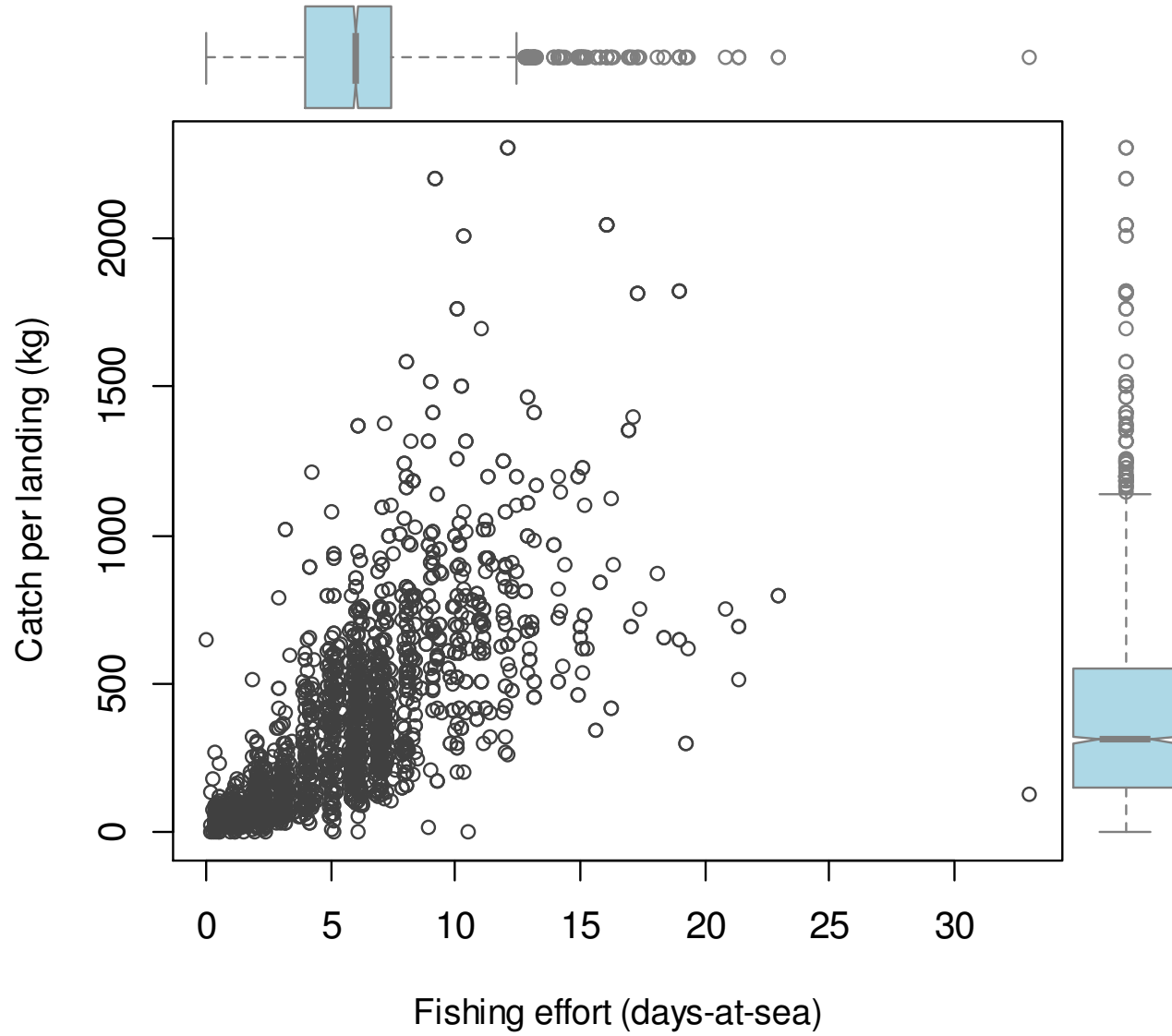
Handline



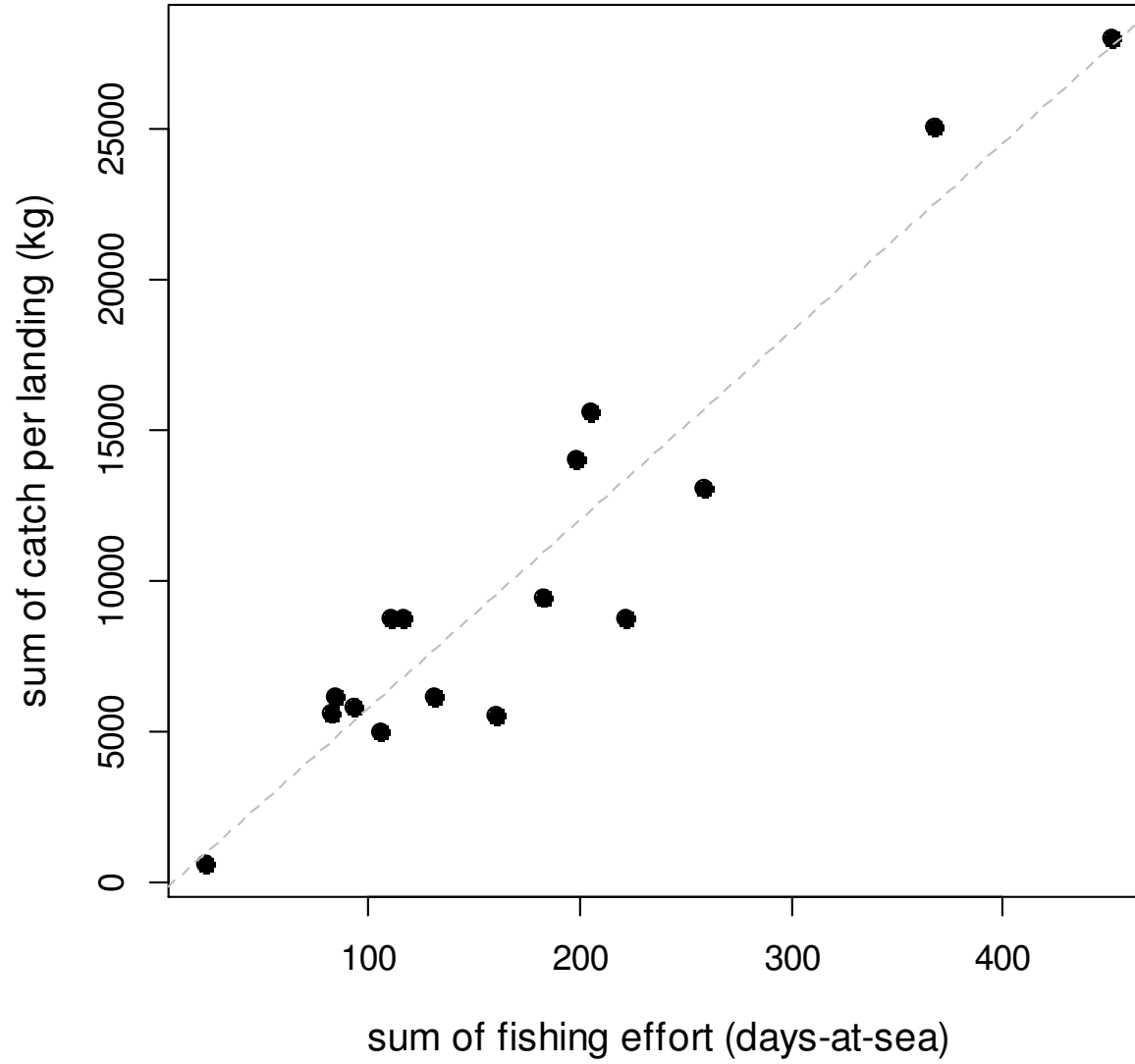
Gillnet



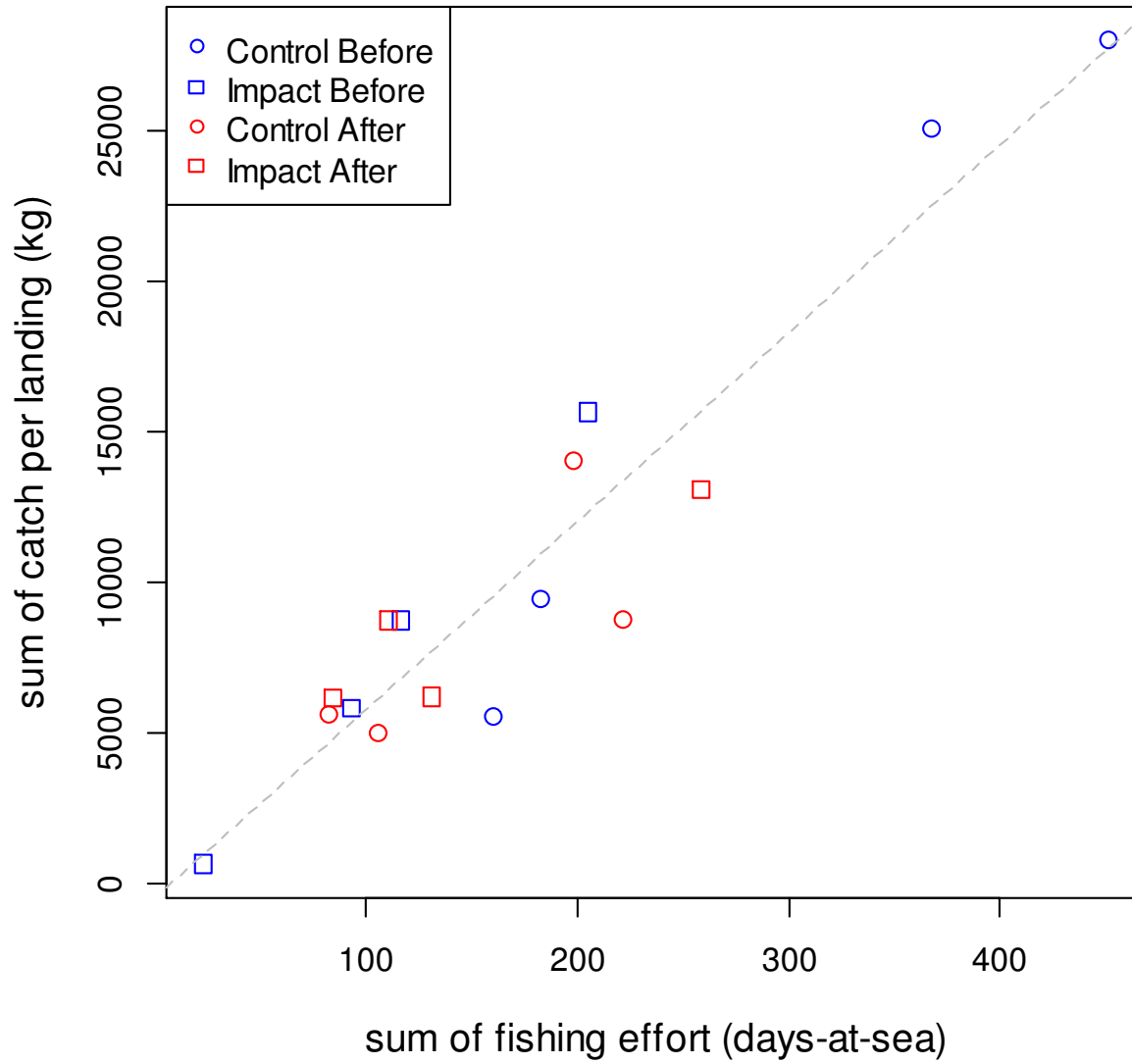
Handline



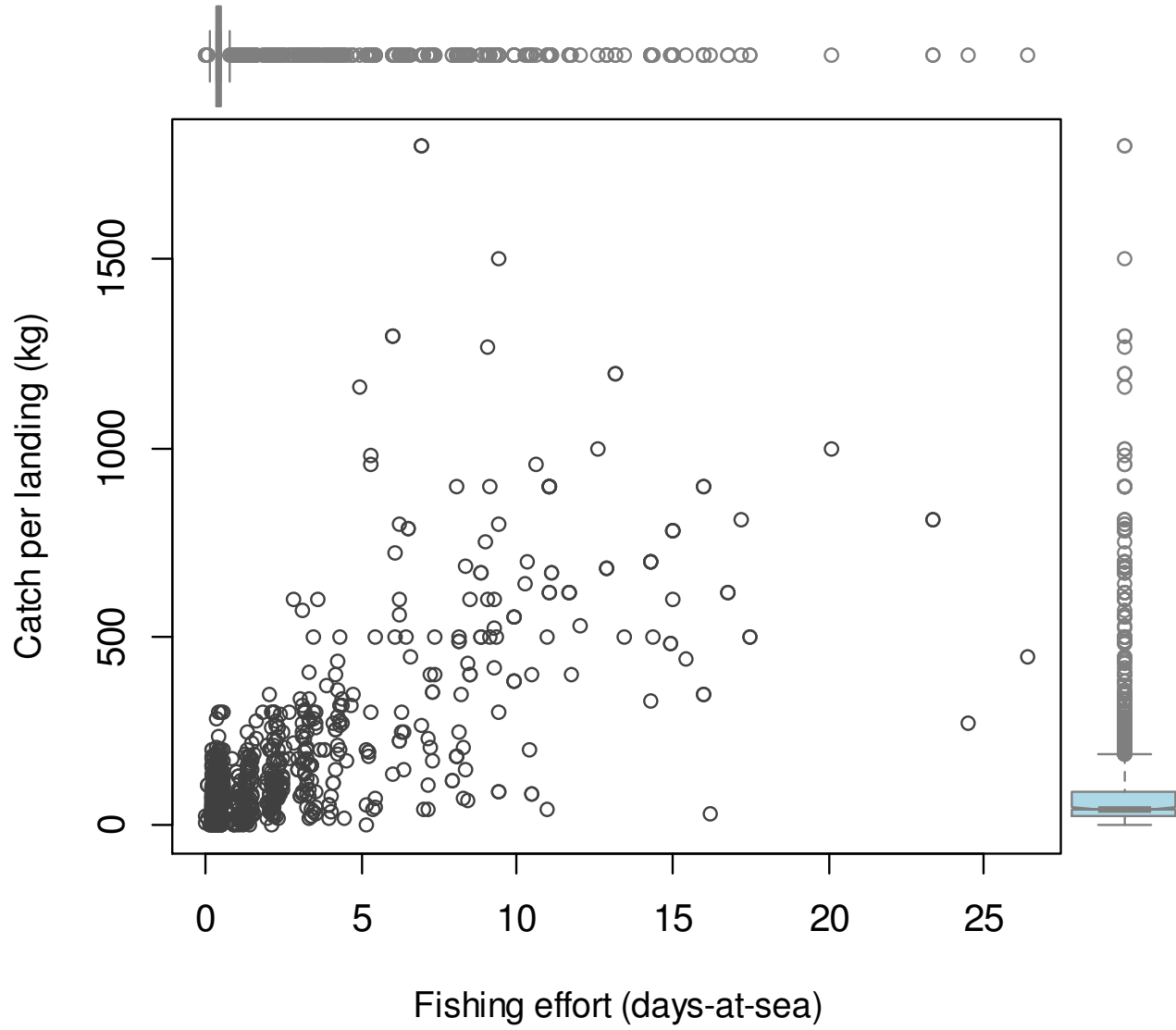
Handline

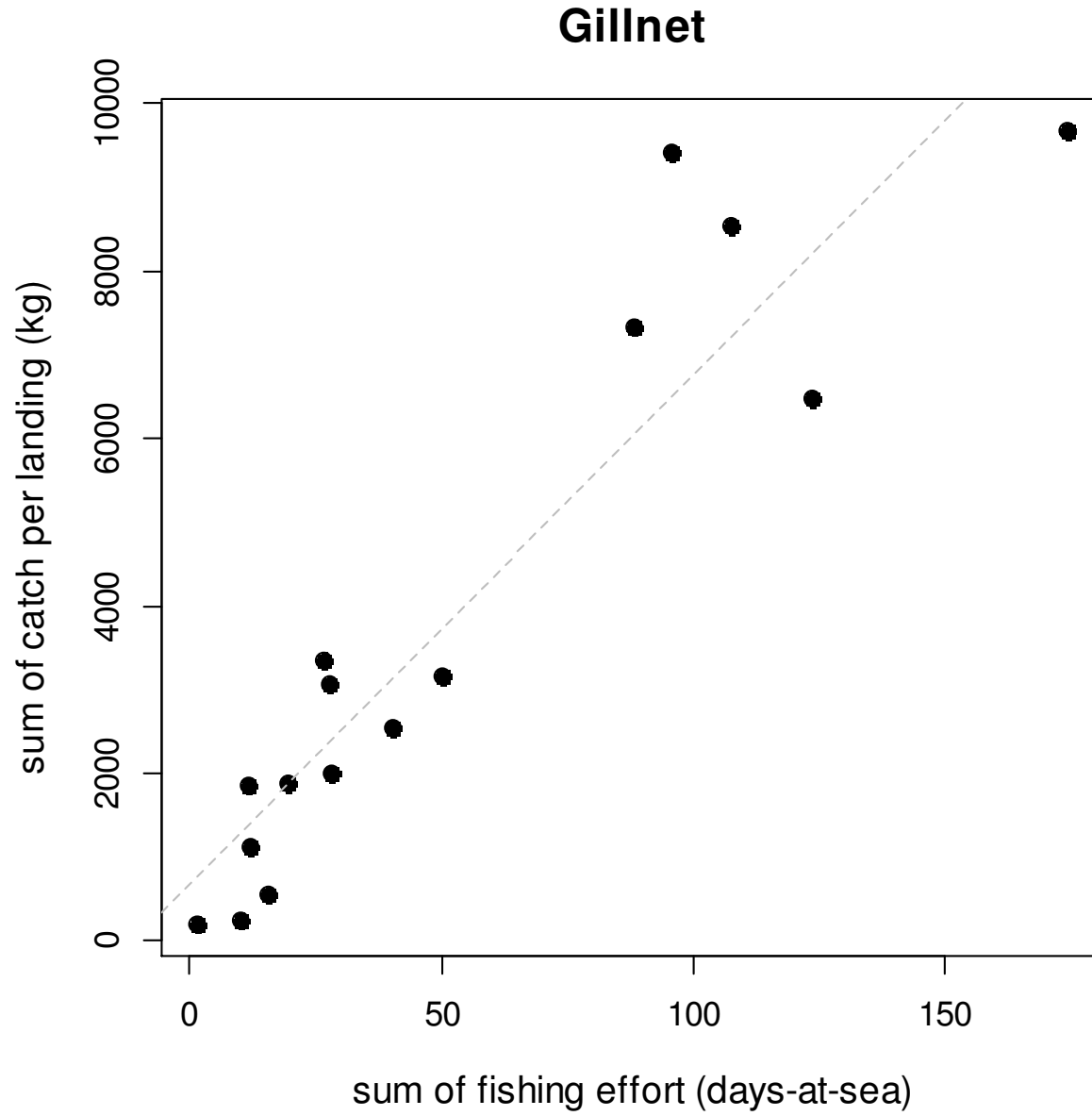


Handline

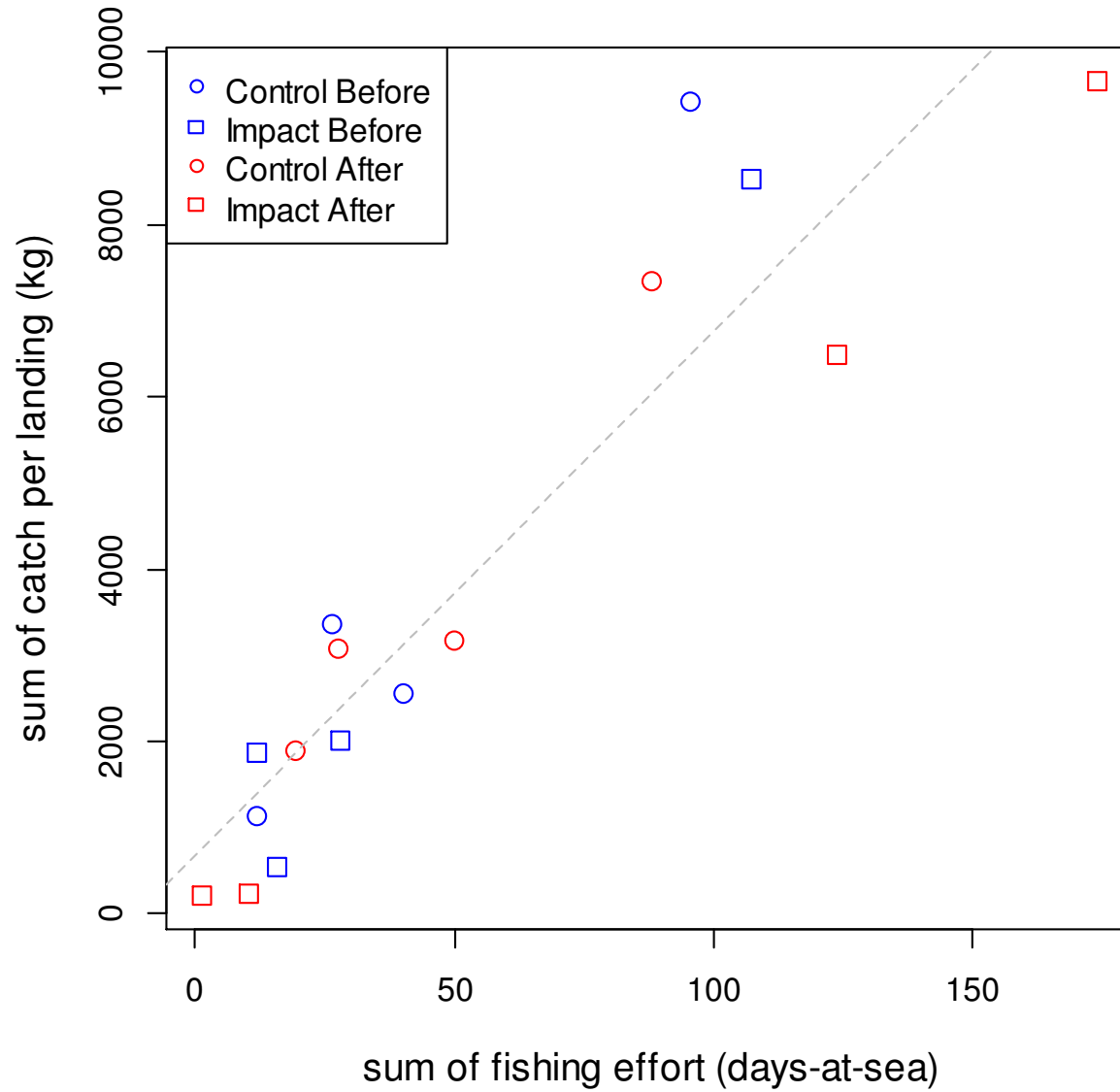


Gillnet





Gillnet



- In shorts

- ✓ In this case , there was no evidence of drilling impact on the catch rates of handline and gillnet fisheries;
- ✓ The applied analysis based on ANCOVA and BACI seems to be a suitable alternative to a quantitative approach on the drilling impacts on fisheries;
- ✓ The current guidelines required in Brazil for environmental license could be improved by defining what questions are really necessary and interesting to answer (thinking about impacts and measurements for assessment);
- ✓ The final reports could provide better support for decisions?

Thank you

rodrigocam@gmail.com