SIOFA Sharks

Annex 5: Catch and Effort Analysis for Centroscymnus coelolepis

DELEGATION OF THE EUROPEAN UNION

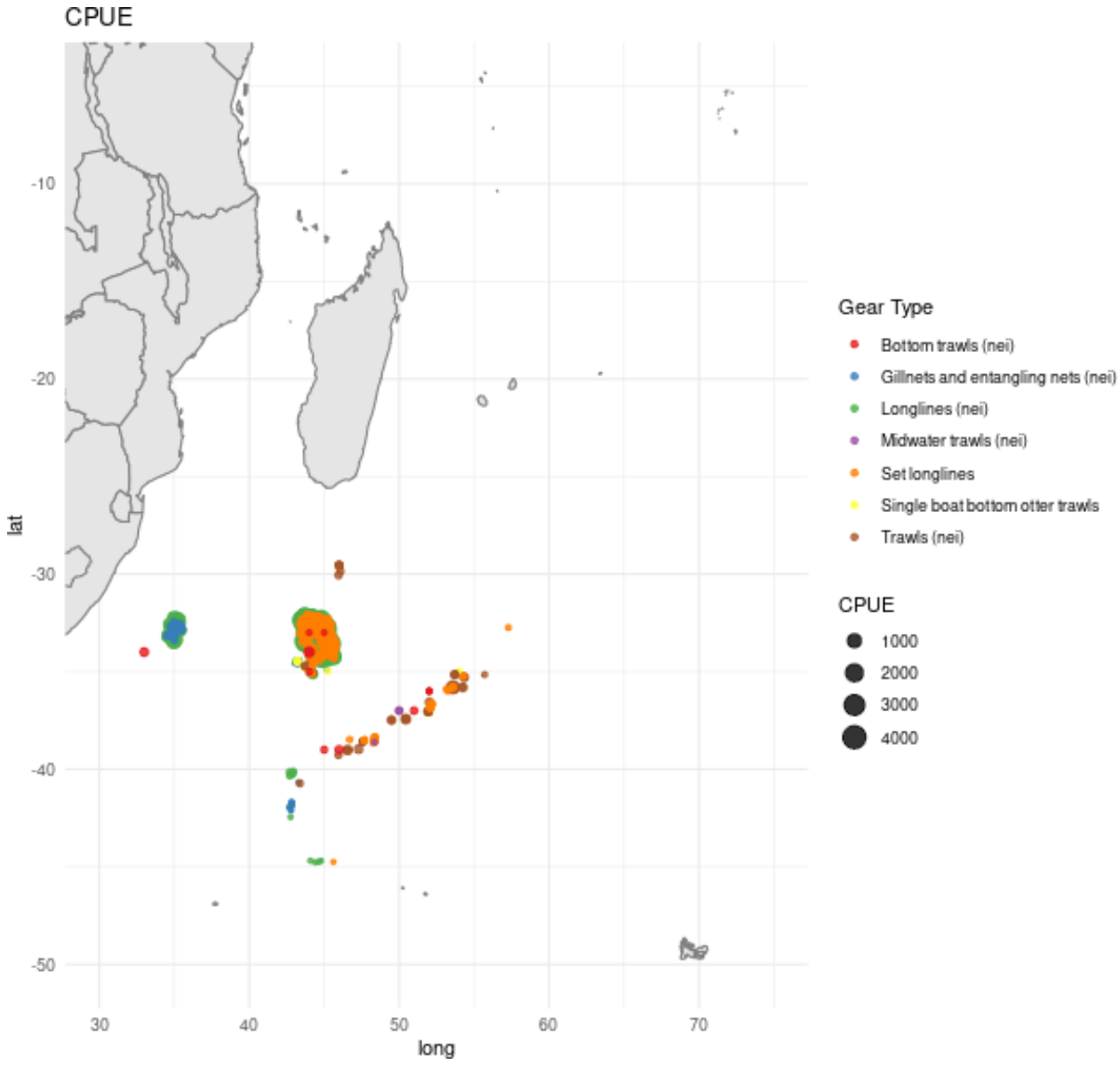
04 March, 2024

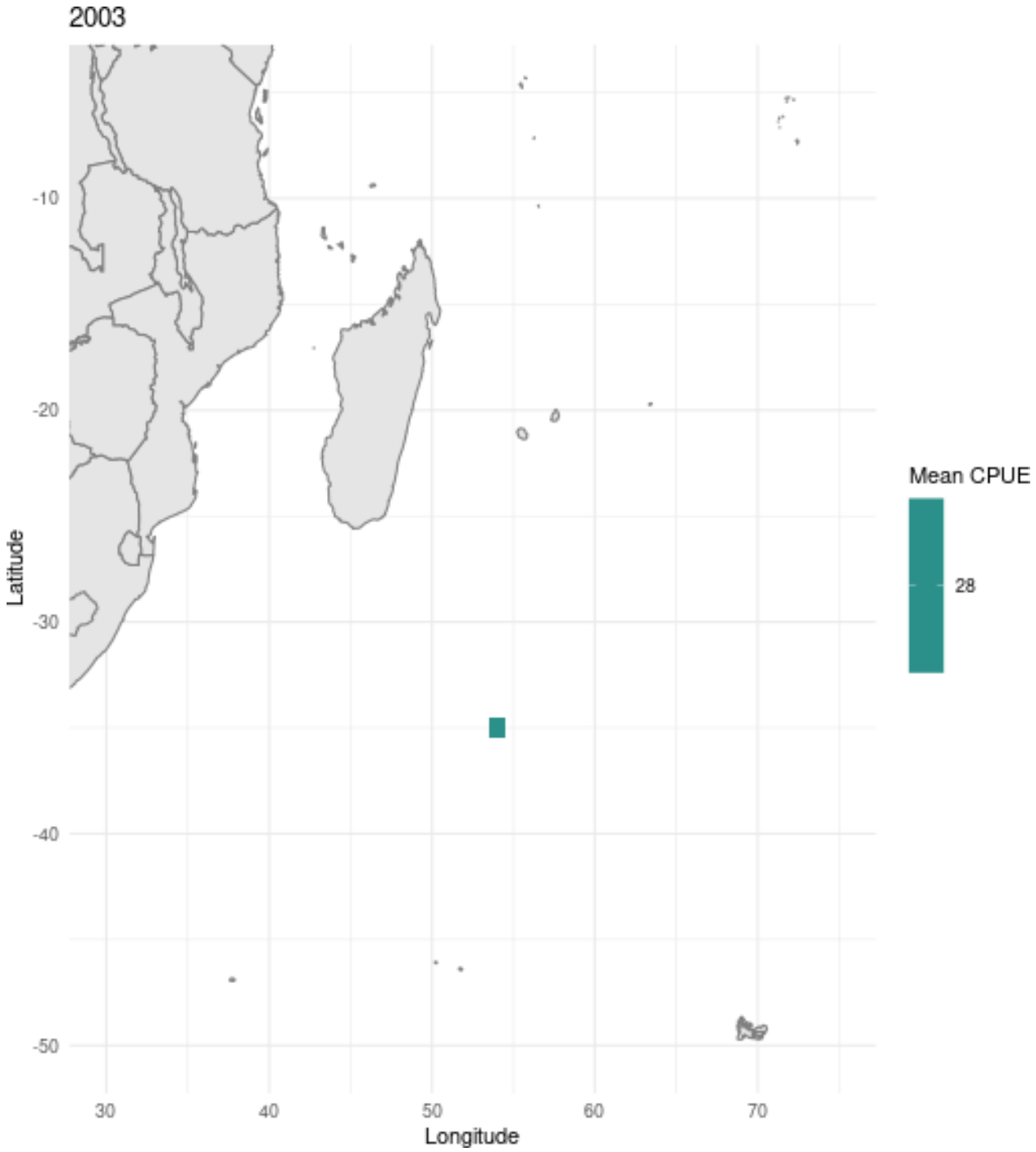
SIOFA dataset

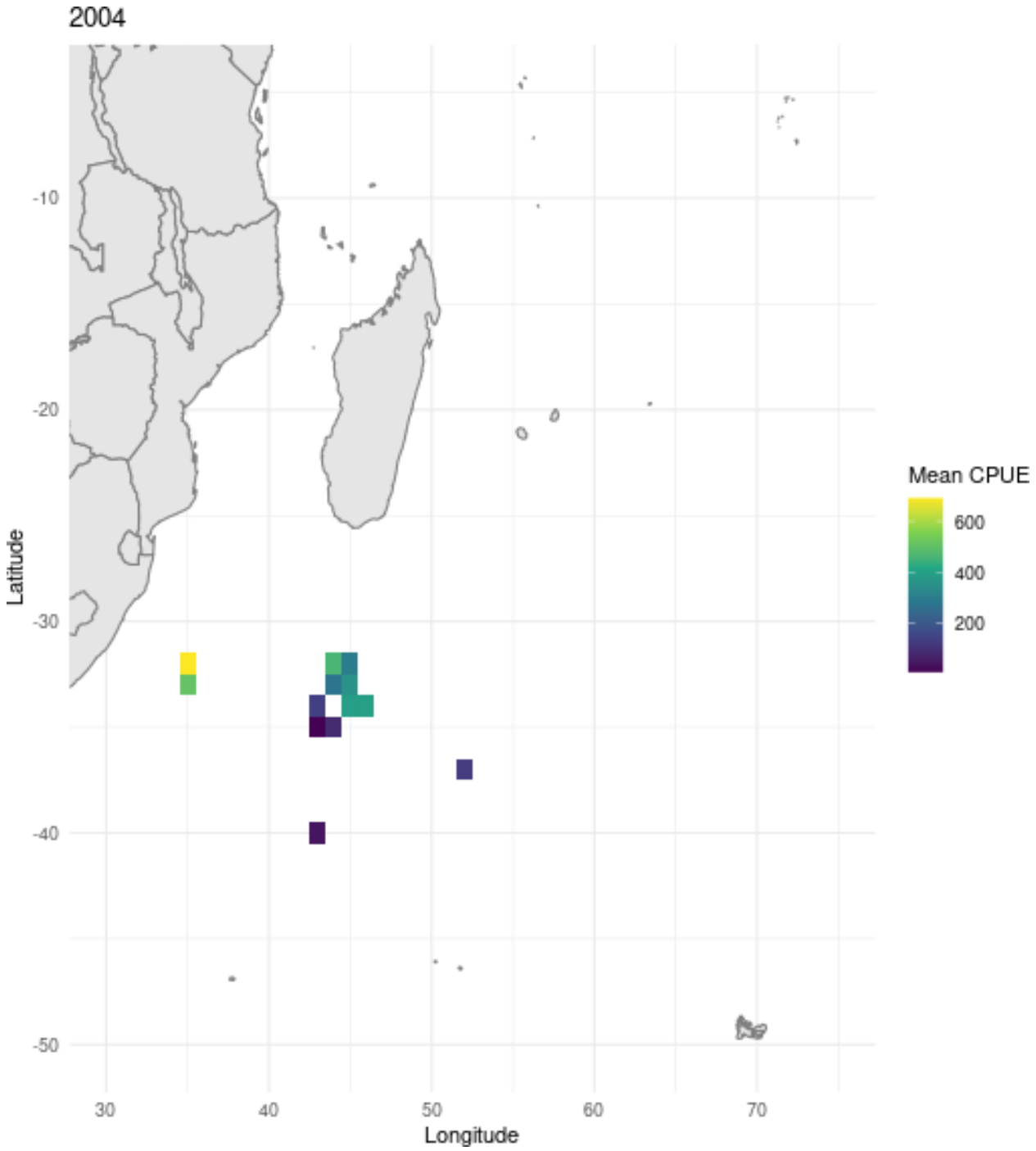
The dataset contains information on shark catches. In this document we focus on the Portugese dogfish (Centroscymnus coelolepsis). Catch-per-unit-of-effort (CPUEs) are calculated for each gear type using different measures of fishing effort depending on the gear. For the different types of trawlers, CPUE is calculated using the tow duration (hours). For gillnets and entangling nets, the net length (m) is used as soaktime was not available for this gear type. For longlines and vertical lines, the number of hooks set was used and, lastly, for set longlines we used soaktime (hours). The time series is from 2003 - 2022, with low data available in 2003 and 2005, and no data available for 2006 and 2007.

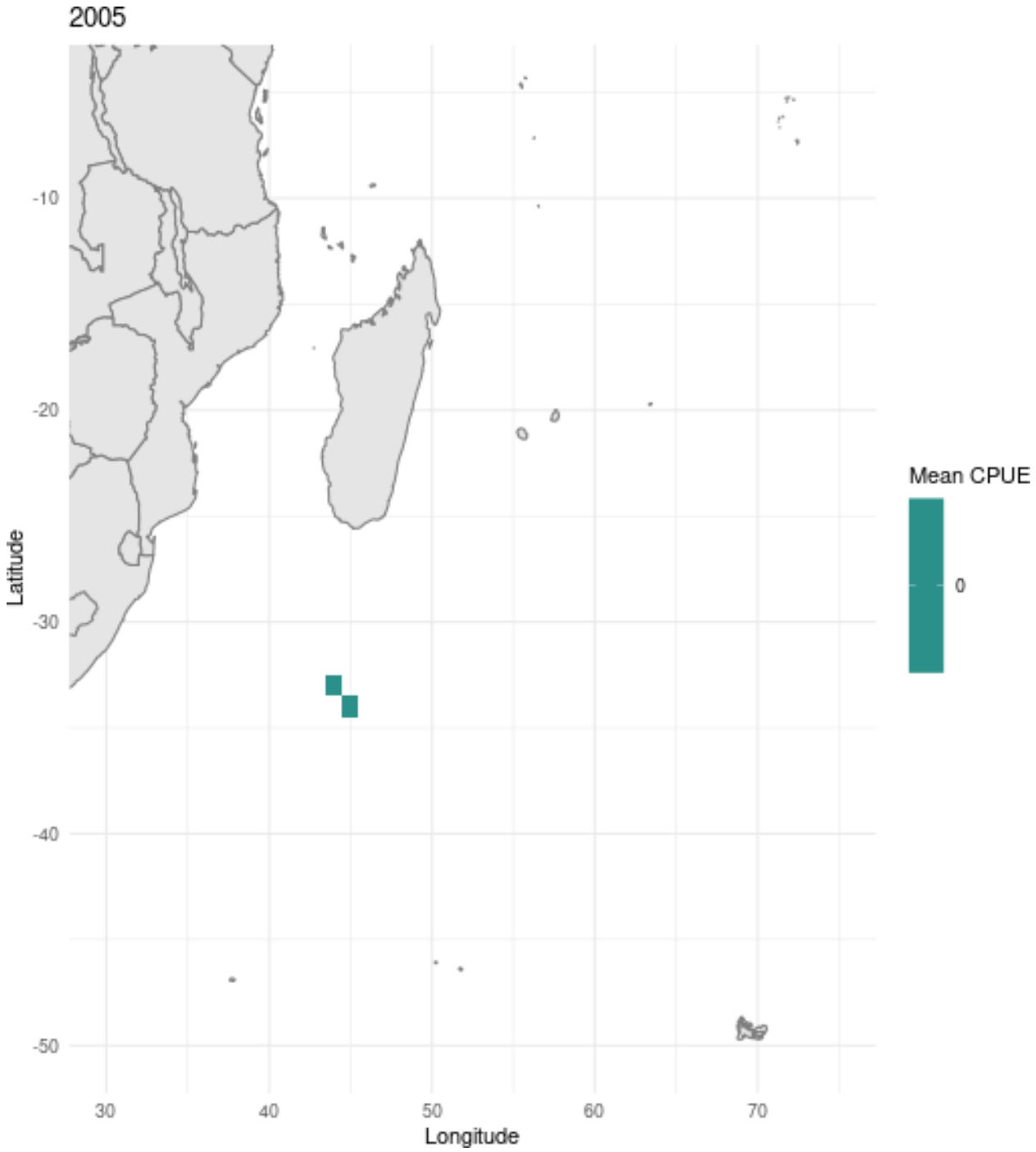
```
# A tibble: 15 x 8
# Groups:   Year [15]
    Year `Bottom trawls (nei)` Gillnets and entangling nets ~1 `Longlines (nei)`
   <dbl>                 <dbl>                           <dbl>              <dbl>
 1  2003                    NA                              NA                 NA
 2  2004                    NA                              NA              78433.
 3  2005                    NA                               0.559             NA
 4  2008                    NA                              32.8               NA
 5  2009                    NA                               9.48              NA
 6  2013                    NA                              31.3               NA
 7  2014                    NA                              34.6               NA
 8  2015                    NA                              13.3            56291.
 9  2016                    NA                              NA              93262.
10  2017                    NA                              NA              40866.
11  2018                  1107.                             NA                 NA
12  2019                    NA                              NA                 NA
13  2020                    NA                              NA                 NA
14  2021                    NA                              NA                 NA
15  2022                    NA                              NA                 NA
# i abbreviated name: 1: `Gillnets and entangling nets (nei)`
# i 4 more variables: `Midwater trawls (nei)` <dbl>, `Set longlines` <dbl>,
#   `Single boat bottom otter trawls` <dbl>, `Trawls (nei)` <dbl>
```

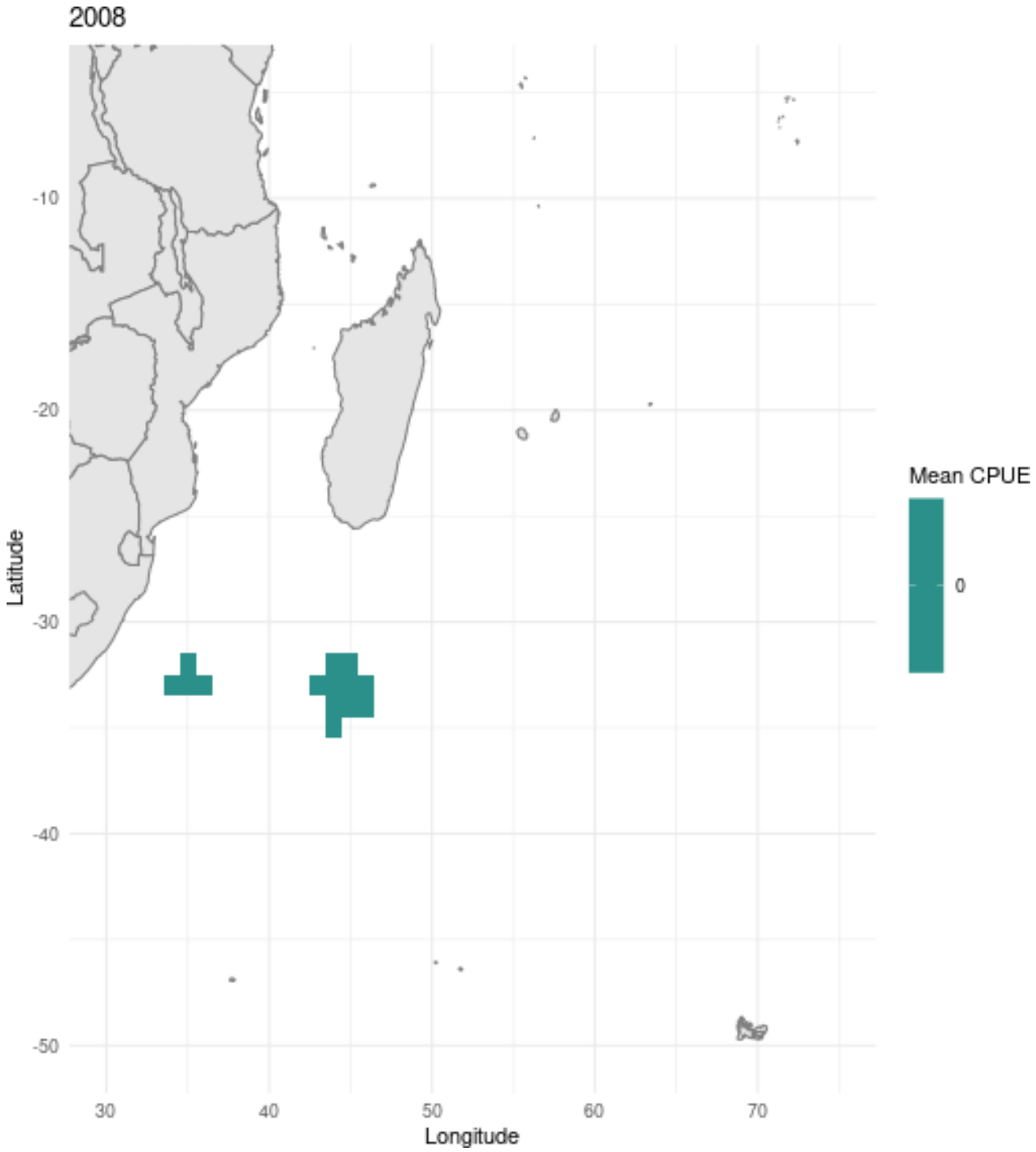
The following maps show the spatio-temporal distribution of CPUE for Portugese dogfish in the SIOFA waters for each of the observed records. The species is found in higher densities on the latitudinal degrees between -30 and -35. Though these maps give some indication on the abundance of the species, it should be noted that these results must be intepreted with caution as the reliability of the effort data is unsure. CPUE for all trawlers is calculated using the tow duration. However this does not account for variations in fishing efficiency or effort due to factors like vessel speed or width of the gear. The lower map shows the mean CPUE per year over all gear types. Note that for most years, there's only data available from 1 gear type.

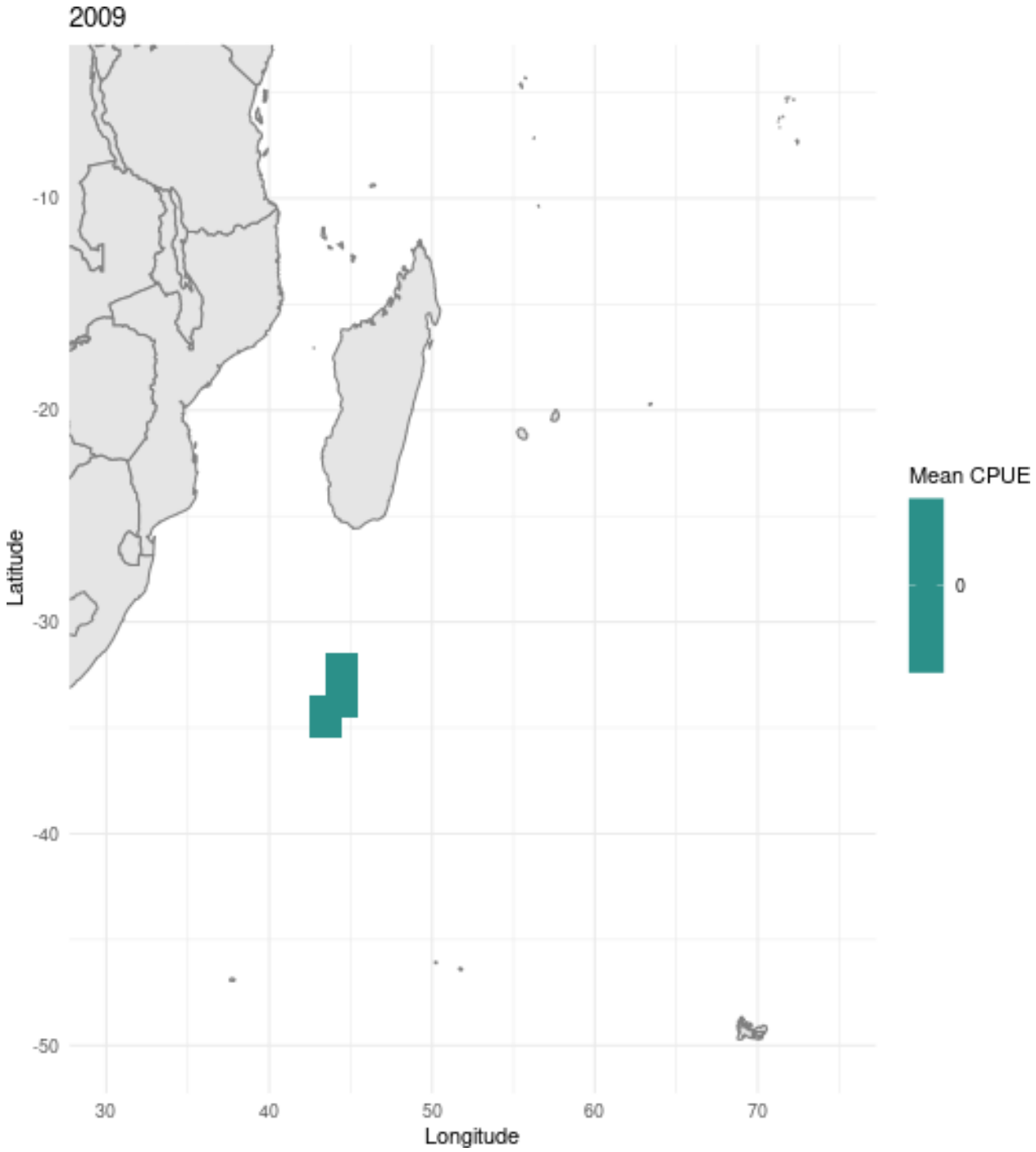

CPUE
-10
-20
-30
-40
-50
lat
30
40
50
60
70
long
Gear Type
Bottom trawls (nei)
Gillnets and entangling nets (nei)
Longlines (nei)
Midwater trawls (nei)
Set longlines
Single boat bottom otter trawls
Trawls (nei)
CPUE
1000
2000
3000
4000

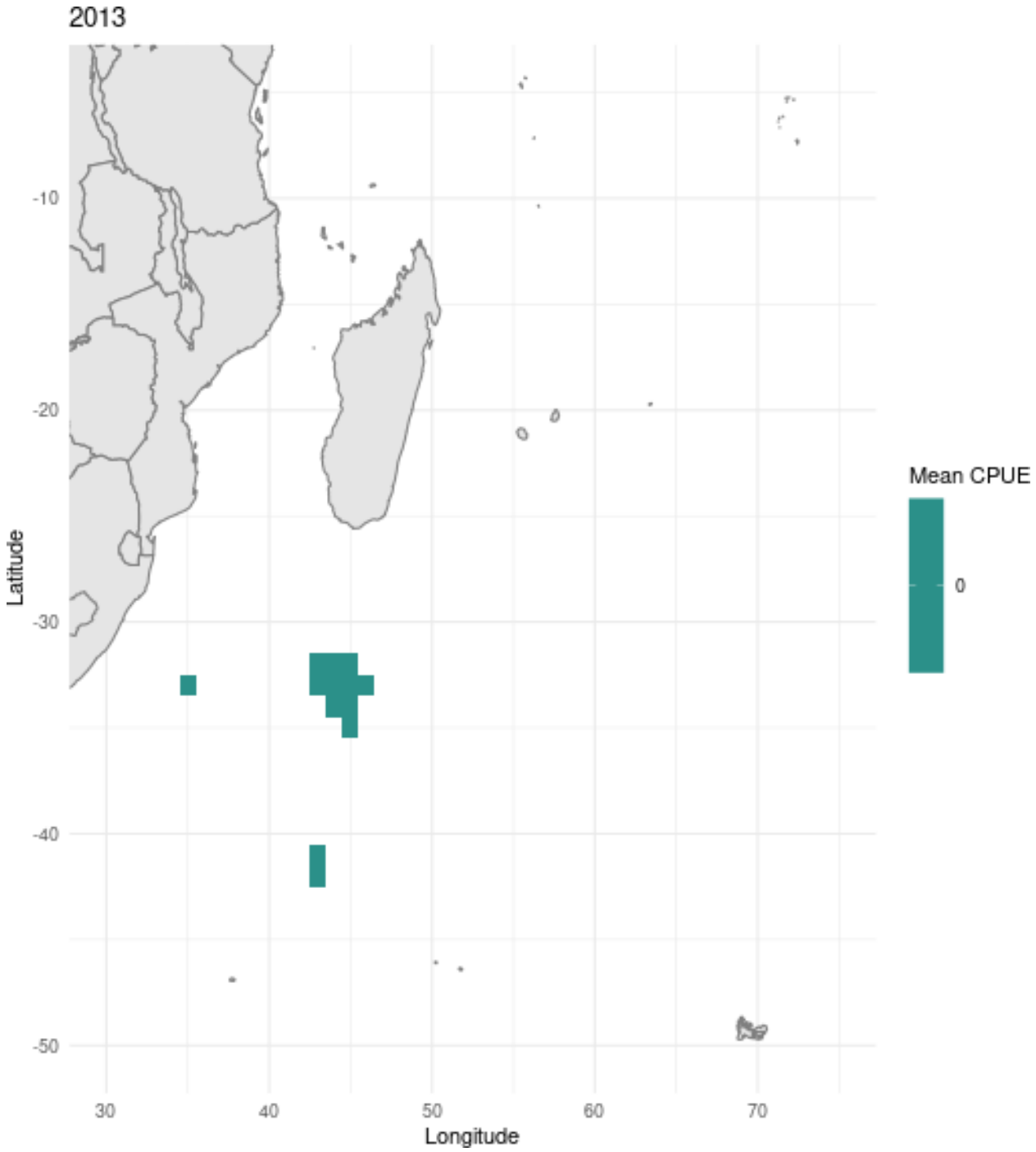

2003
-10
-20
-30
-40
-50
Latitude
30
40
50
60
70
Longitude
Mean CPUE
28

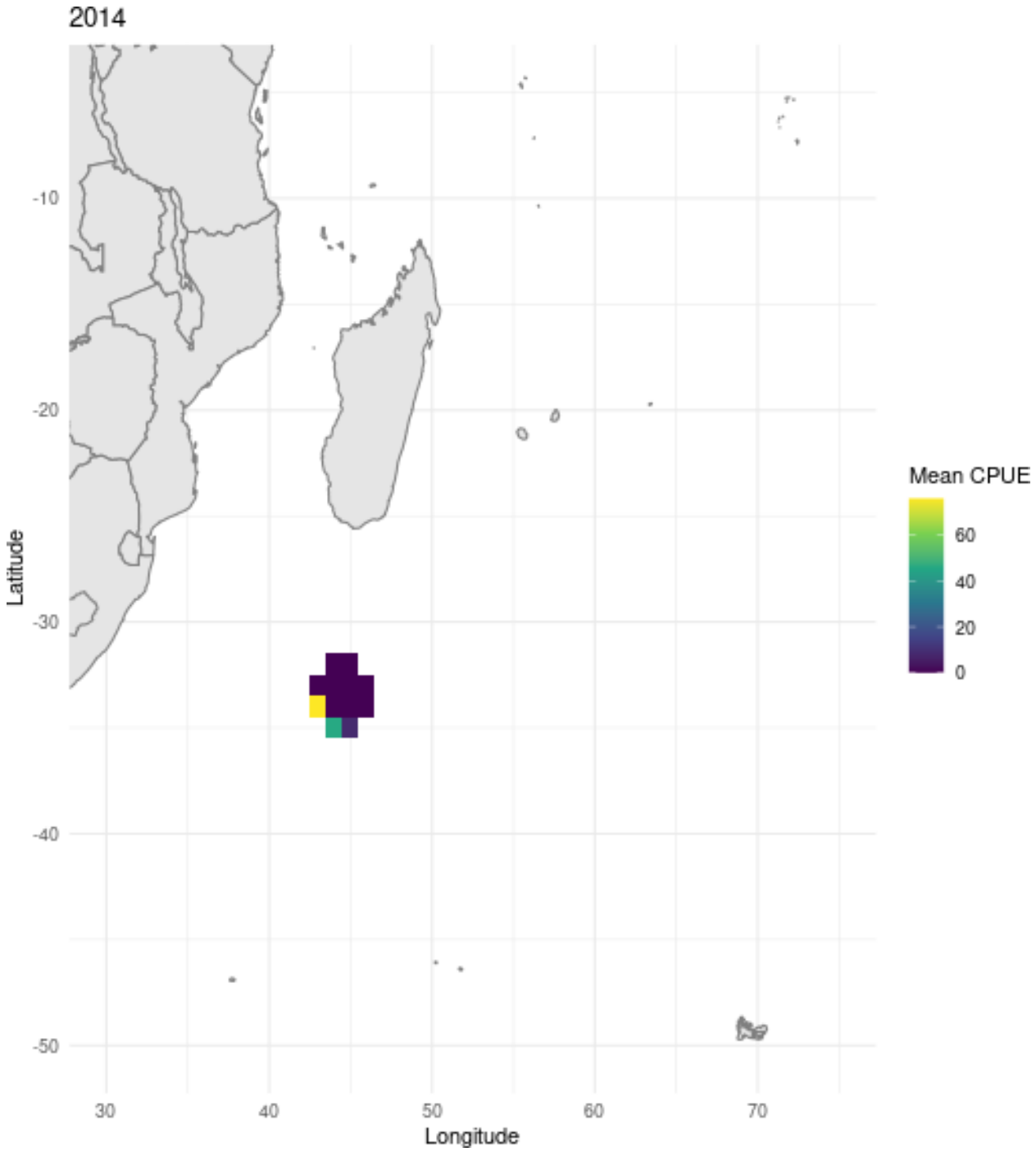

2004
-10
-20
-30
-40
-50
Latitude
30
40
50
60
70
Longitude
Mean CPUE
600
400
200

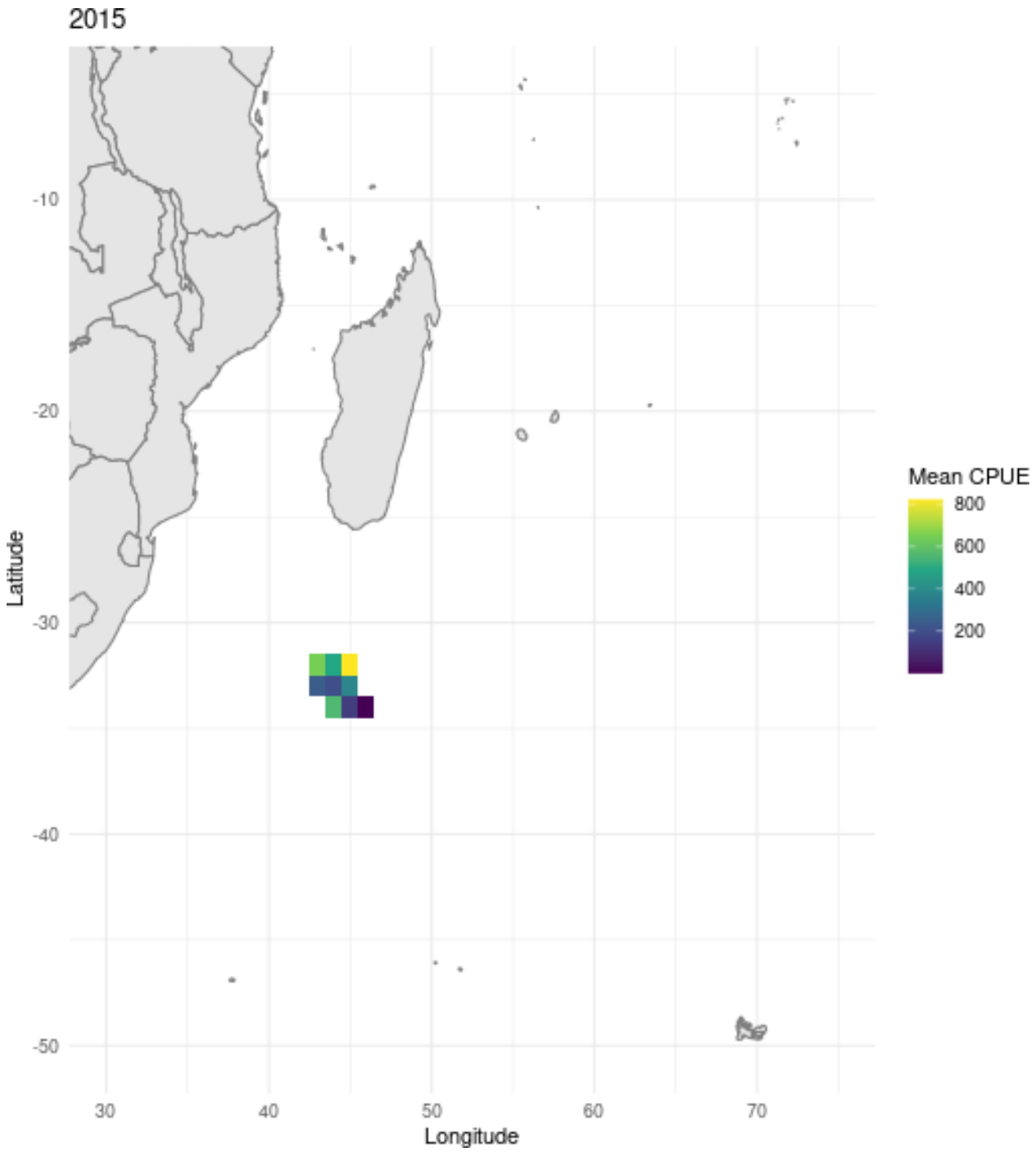

2005
-10
-20
-30
-40
-50
Latitude
30
40
50
60
70
Longitude
Mean CPUE
0

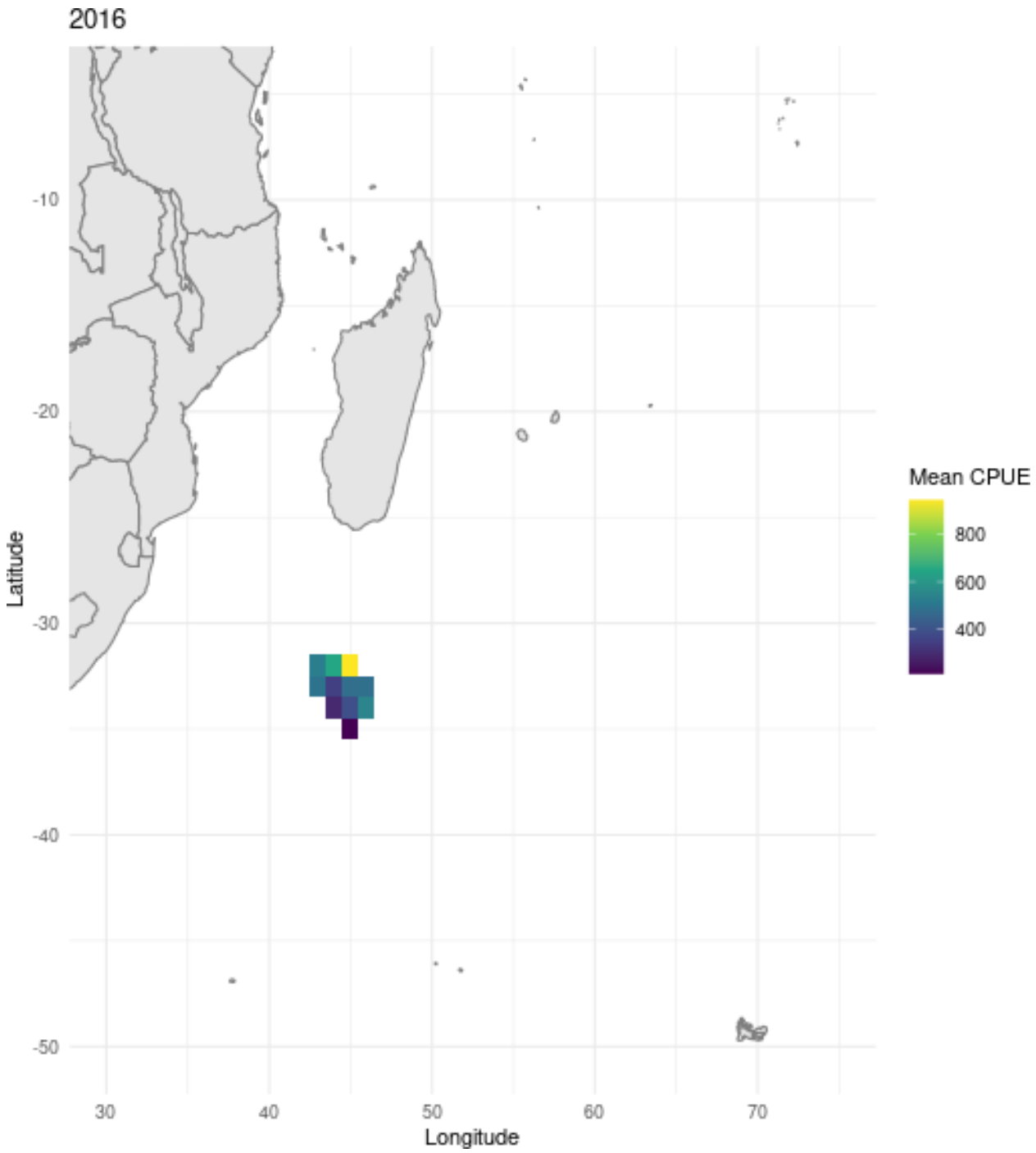

2008
-10
-20
-30
-40
-50
Latitude
30
40
50
60
70
Longitude
Mean CPUE
0

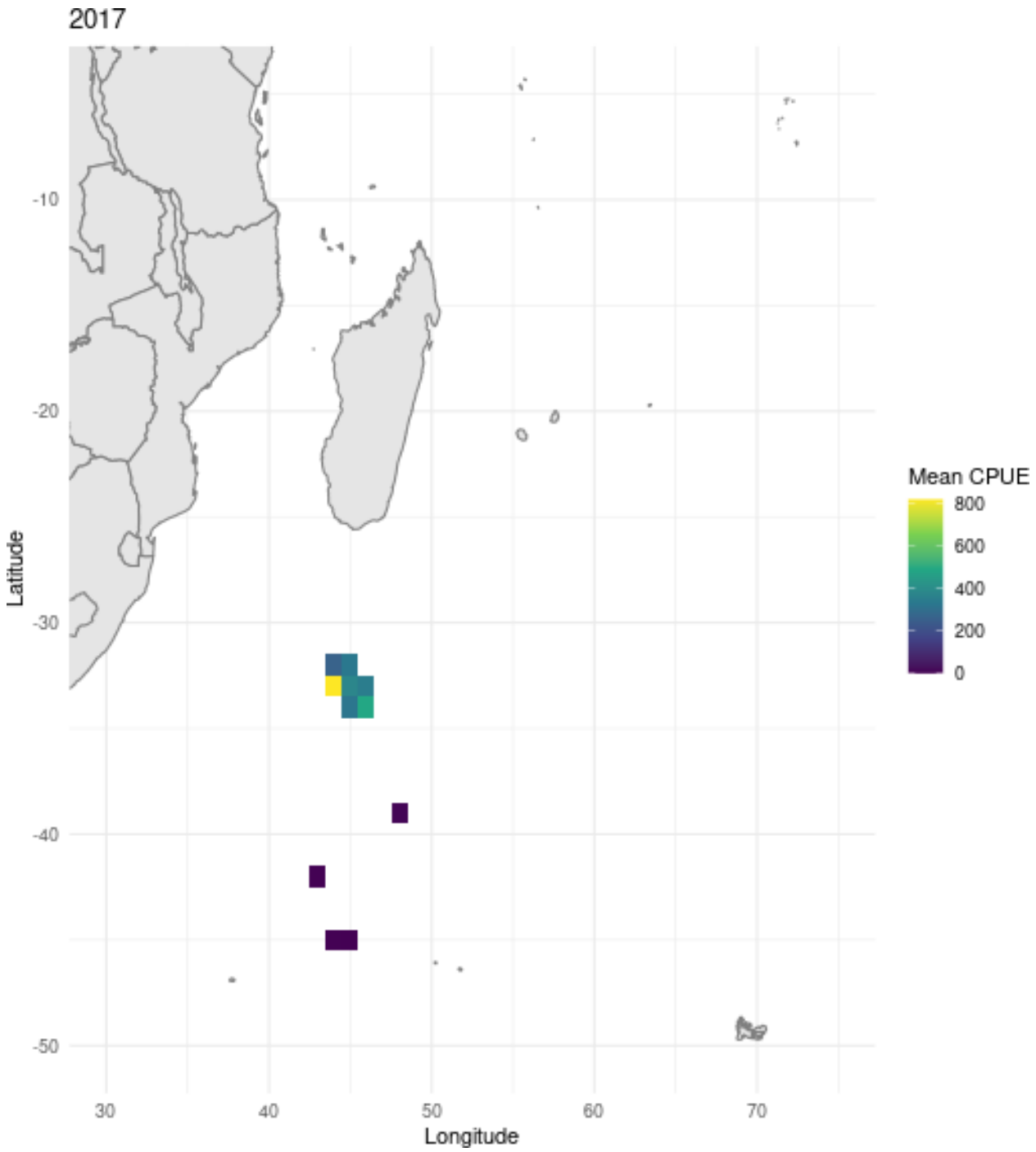

2009
-10
-20
-30
-40
-50
Latitude
30
40
50
60
70
Longitude
Mean CPUE
0

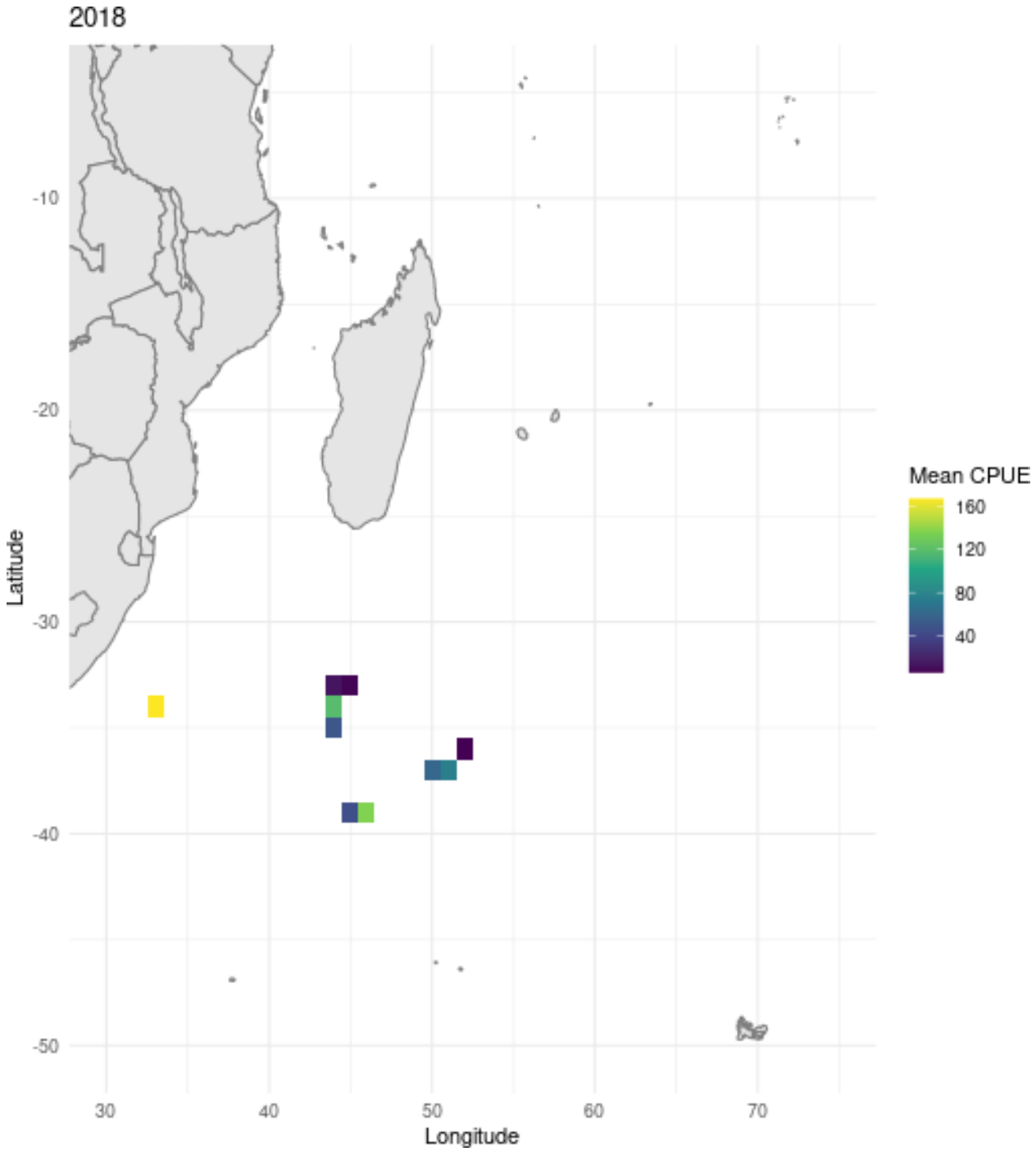

2013
-10
-20
-30
-40
-50
Latitude
30
40
50
60
70
Longitude
Mean CPUE
0

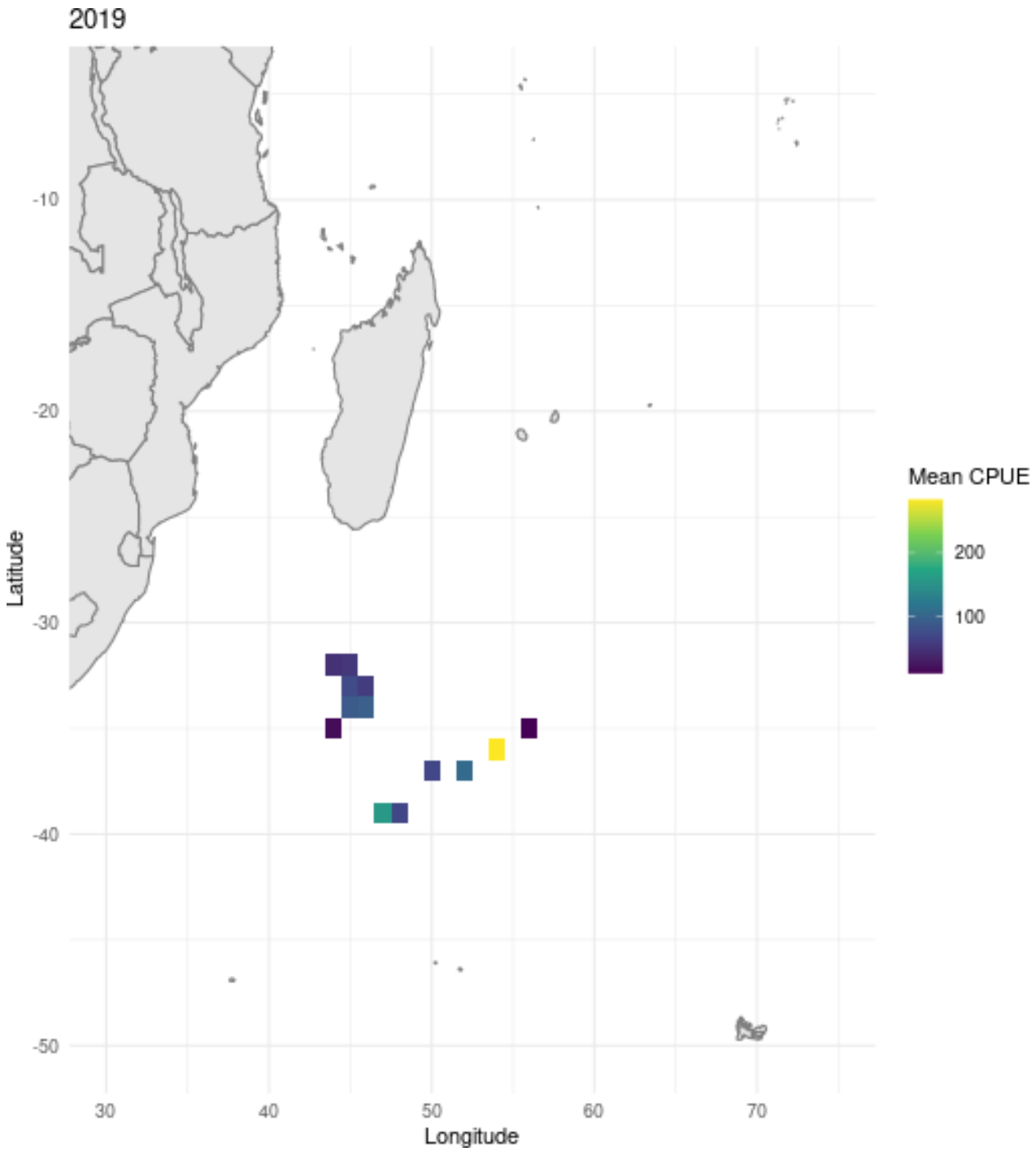

2014
-10
-20
-30
-40
-50
Latitude
30
40
50
60
70
Longitude
Mean CPUE
60
40
20
0

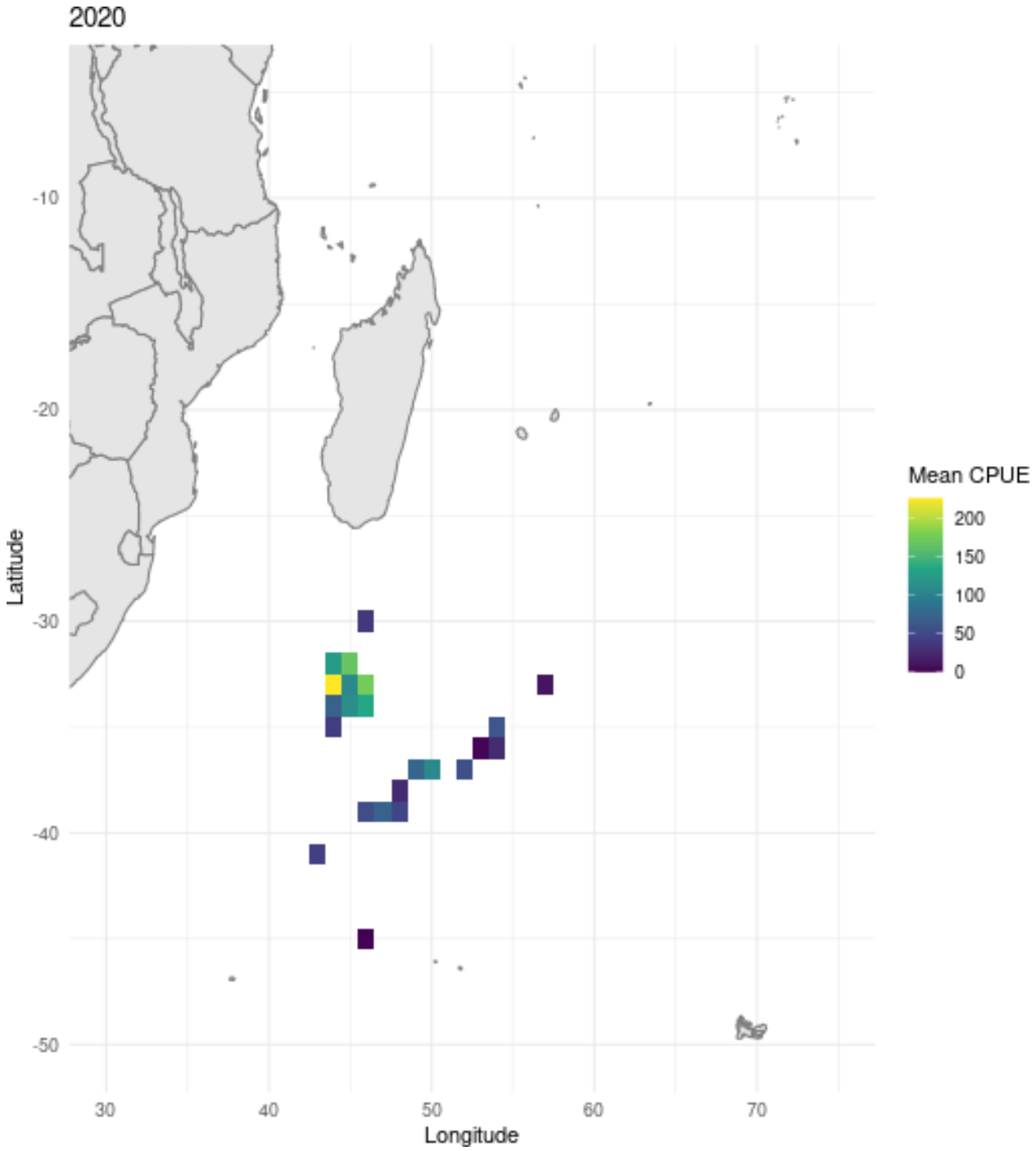

2015
-10
-20
-30
-40
-50
Latitude
30
40
50
60
70
Longitude
Mean CPUE
800
600
400
200

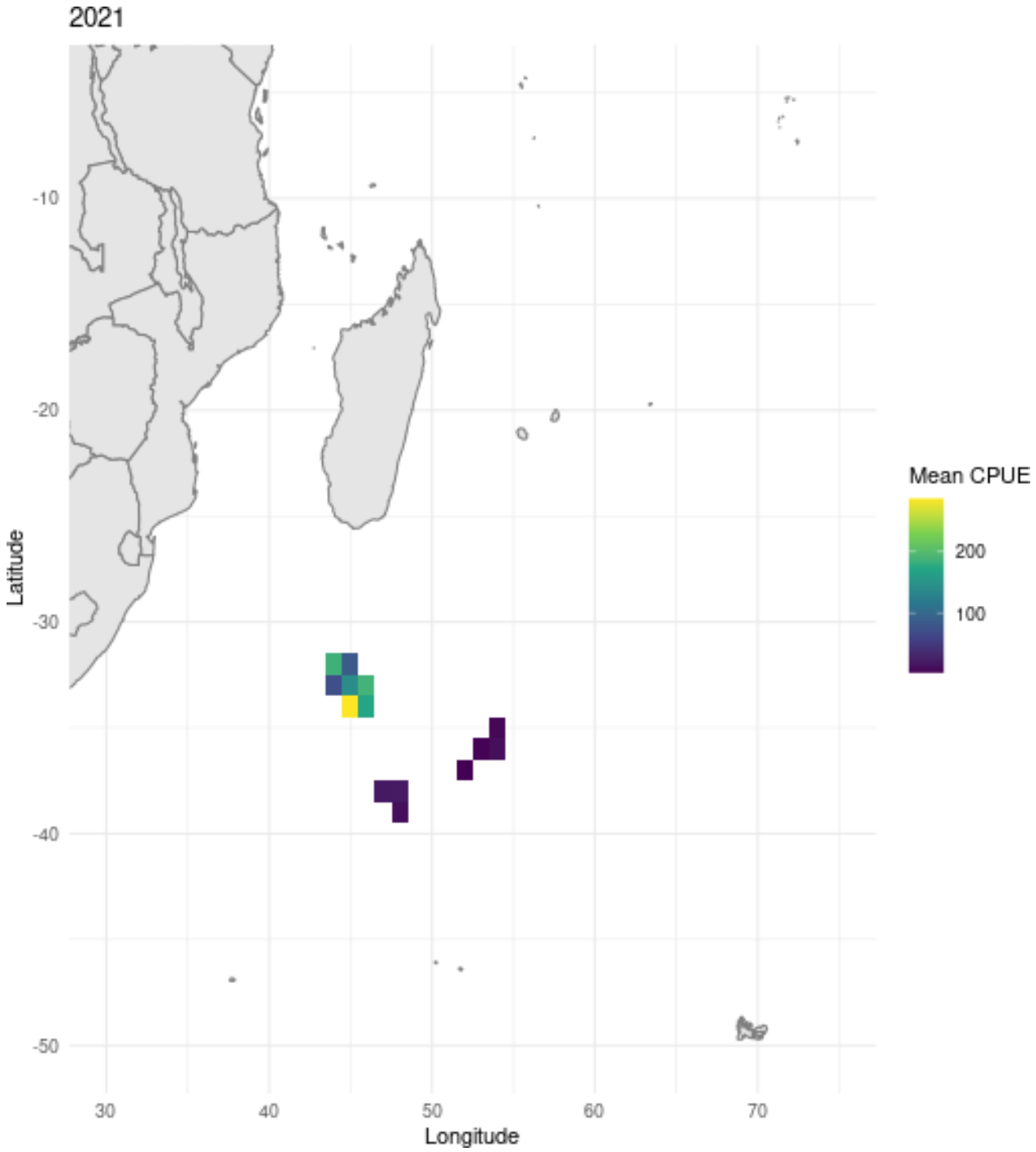

2016
-10
-20
-30
-40
-50
Latitude
30
40
50
60
70
Longitude
Mean CPUE
800
600
400

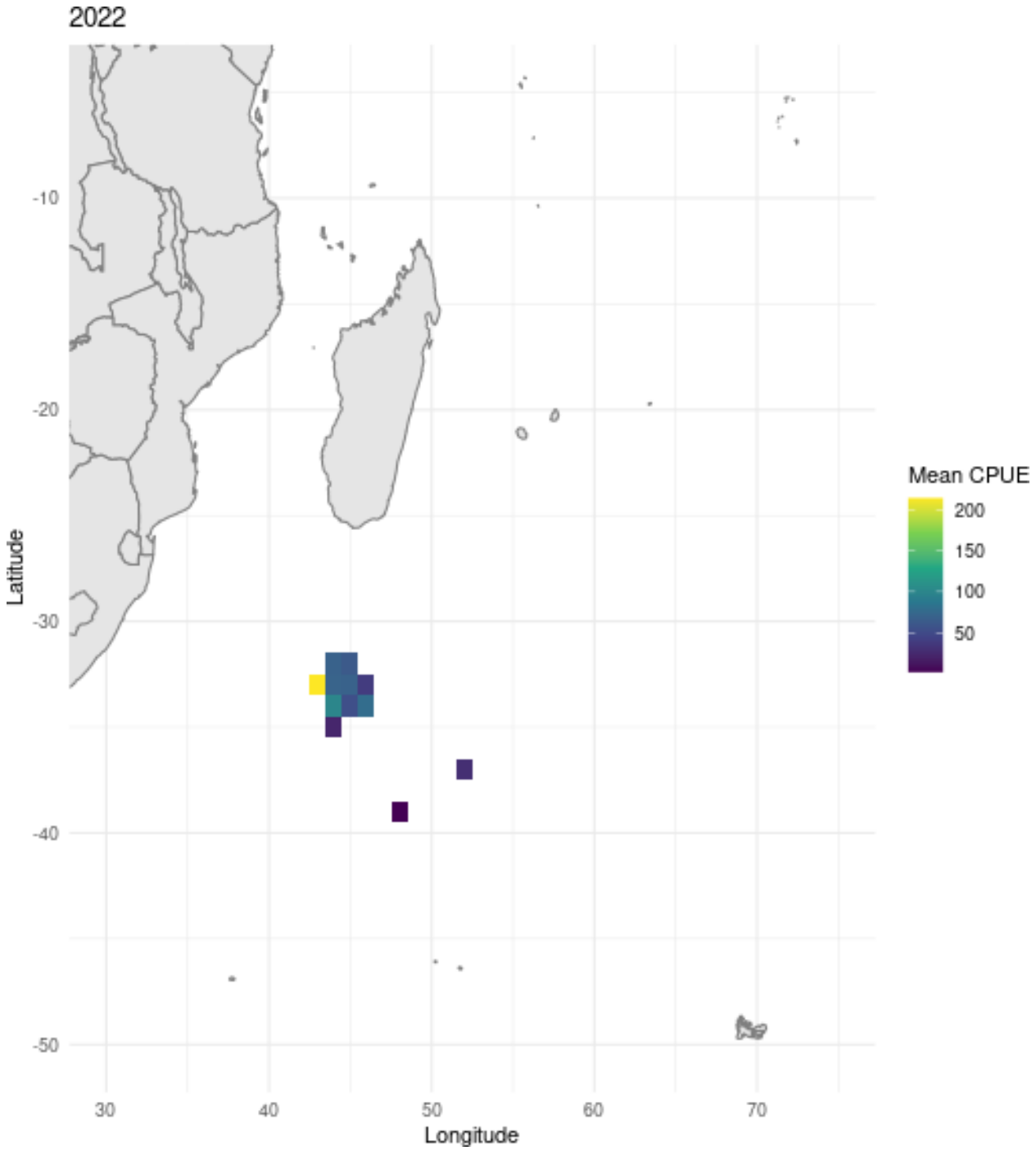

2017
-10
-20
-30
-40
-50
Latitude
30
40
50
60
70
Longitude
Mean CPUE
800
600
400
200
0


2018
-10
-20
-30
-40
-50
Latitude
30
40
50
60
70
Longitude
Mean CPUE
160
120
80
40

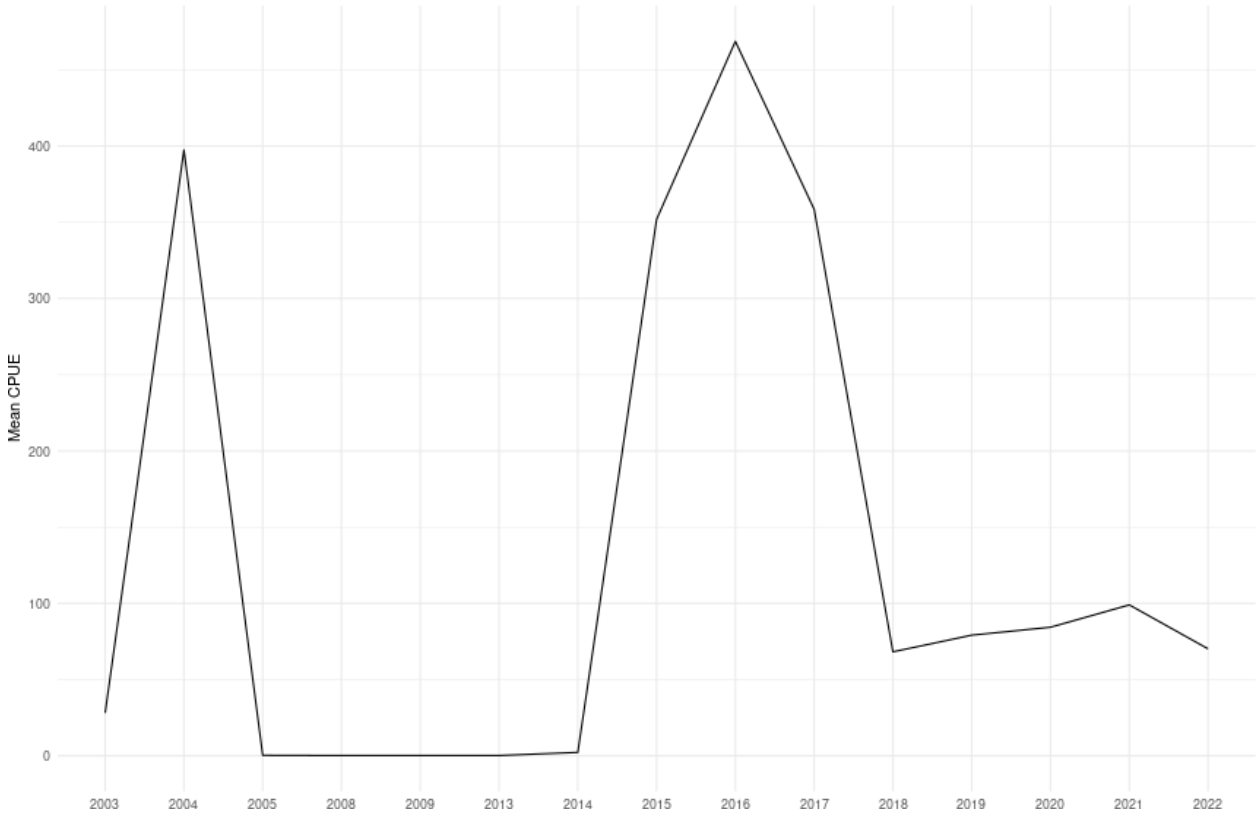

2019
-10
-20
-30
-40
-50
Latitude
30
40
50
60
70
Longitude
Mean CPUE
200
100


2020
-10
-20
-30
-40
-50
Latitude
30
40
50
60
70
Longitude
Mean CPUE
200
150
100
50
0


2021
-10
-20
-30
-40
-50
Latitude
30
40
50
60
70
Longitude
Mean CPUE
200
100



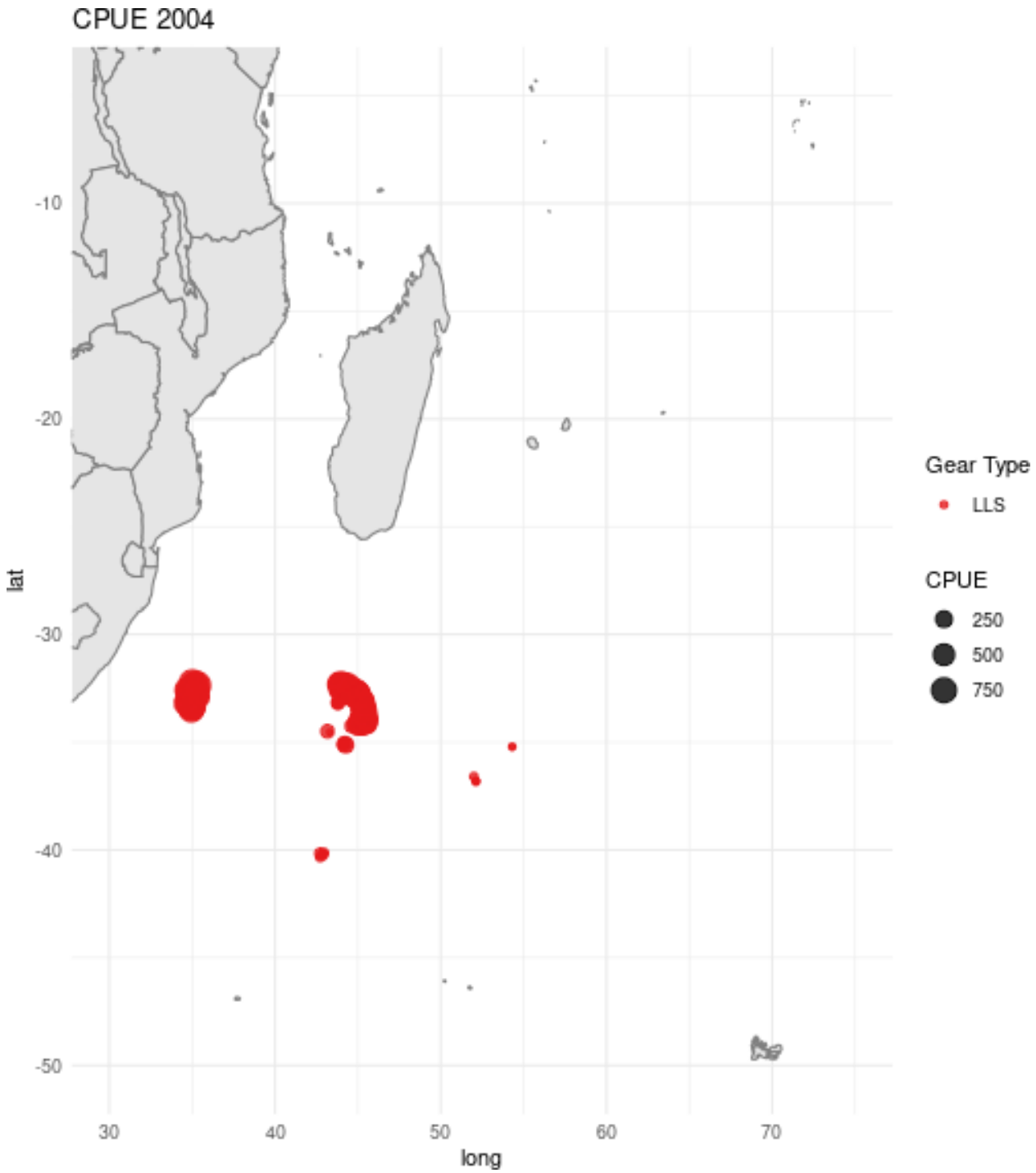
Mean CPUE is calculated per year. These results should be interpreted with caution as for some years, this calculated with CPUEs from different gear types (e.g. gillnets and trawlers).

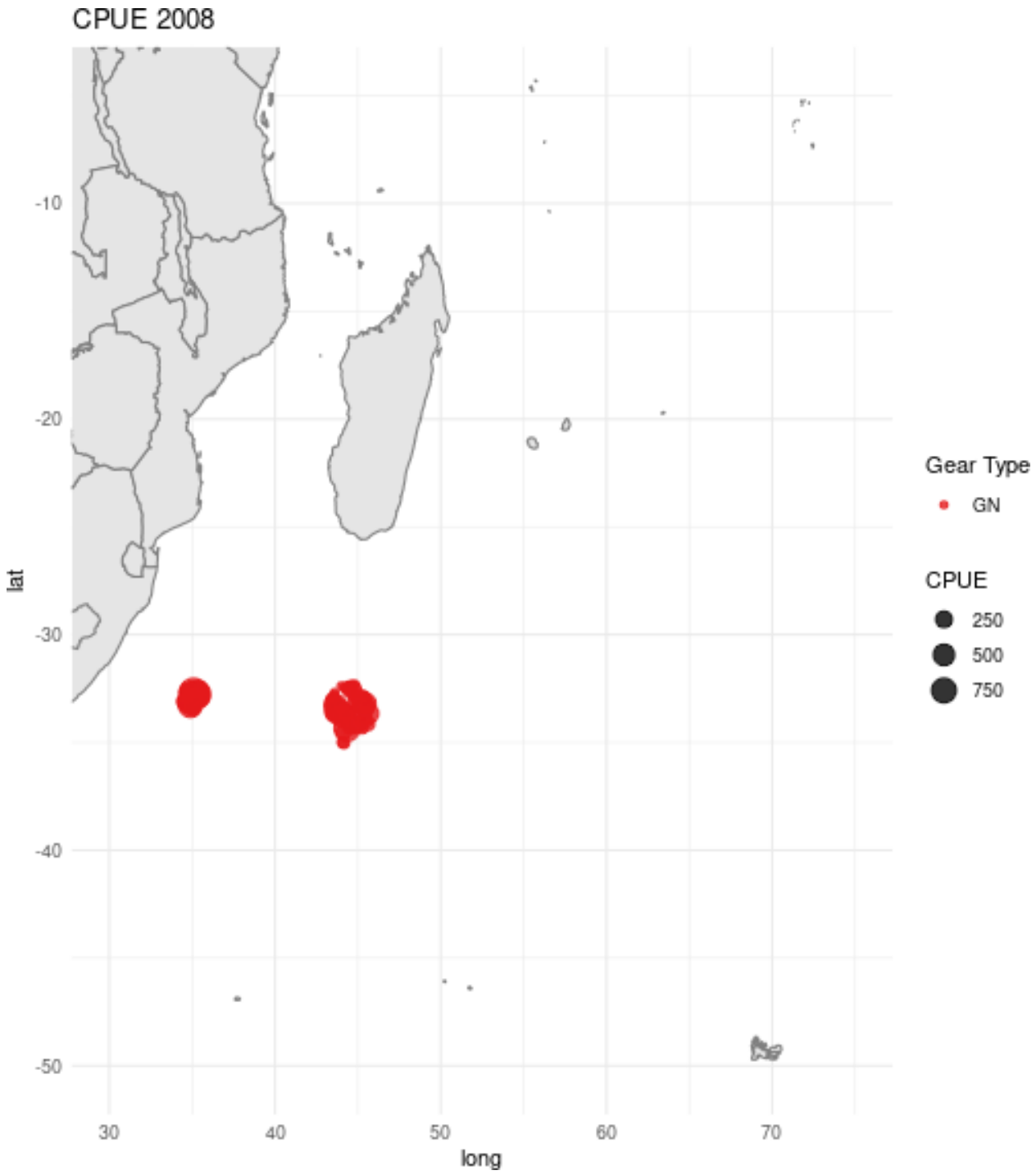


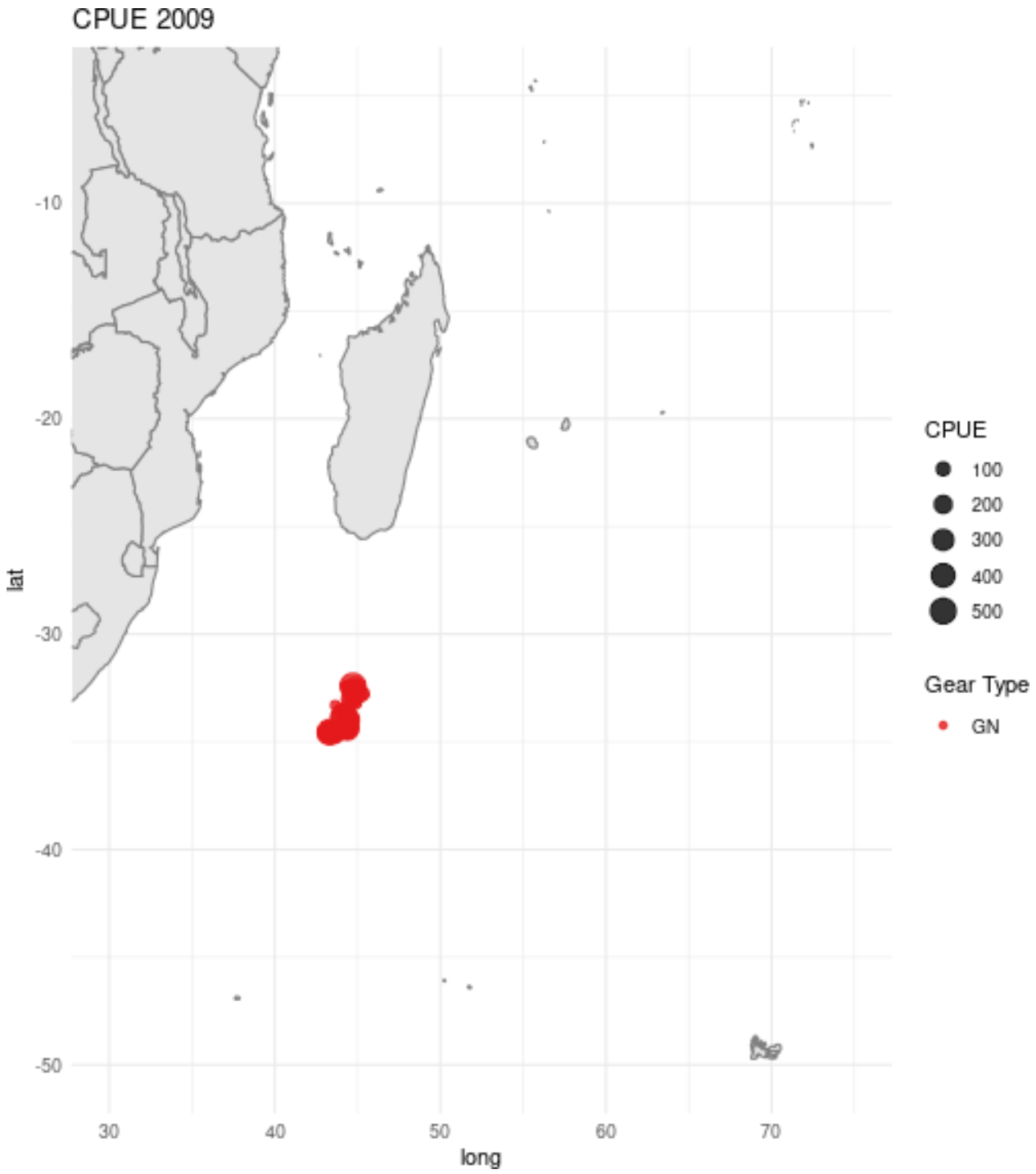
IEO dataset

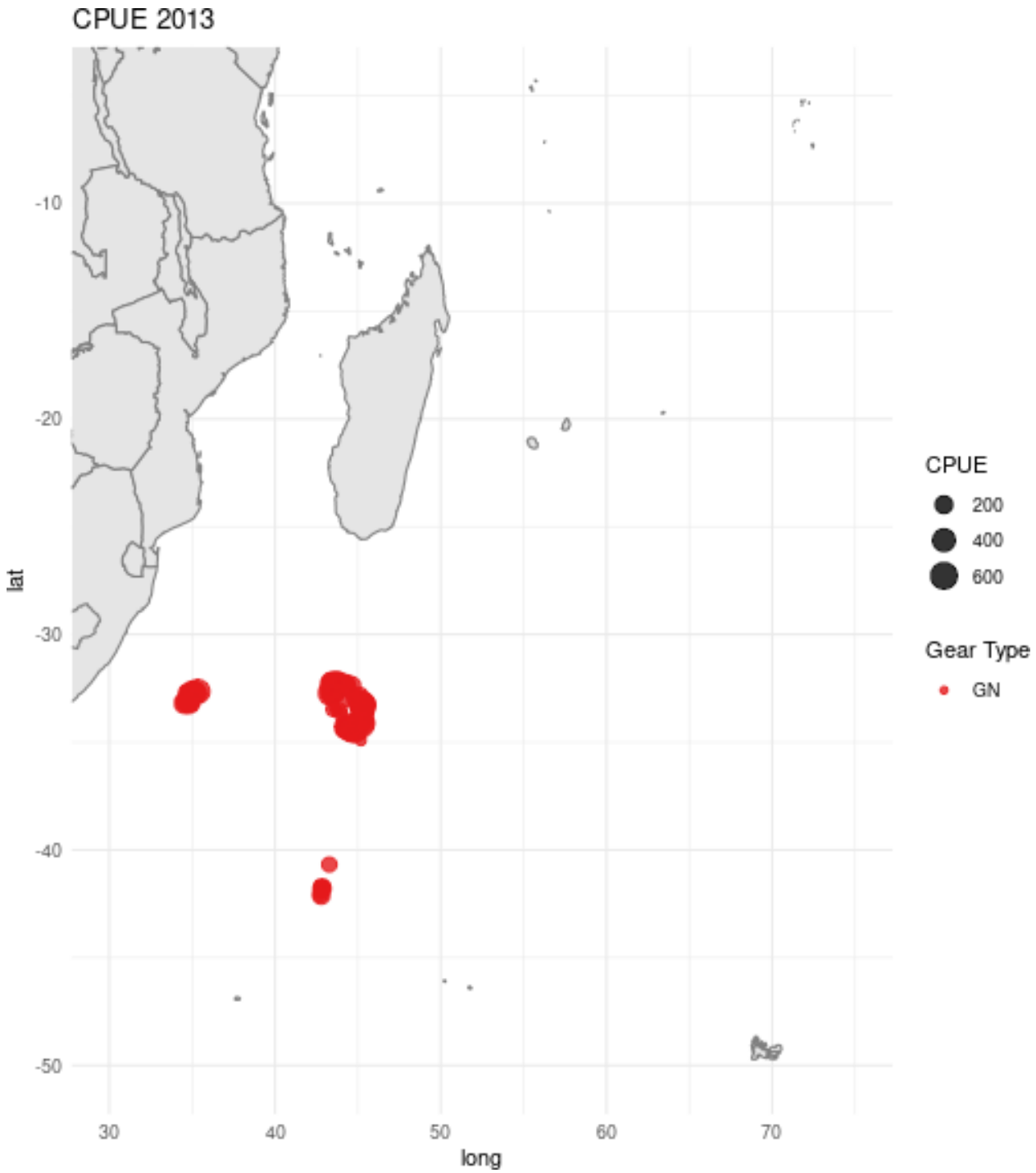
Logbook data containing catches of Portugese dogfish from 2004 to 2022. Years 2006 and 2010 to 2012 are not available. For 2007, only 1 record is available.

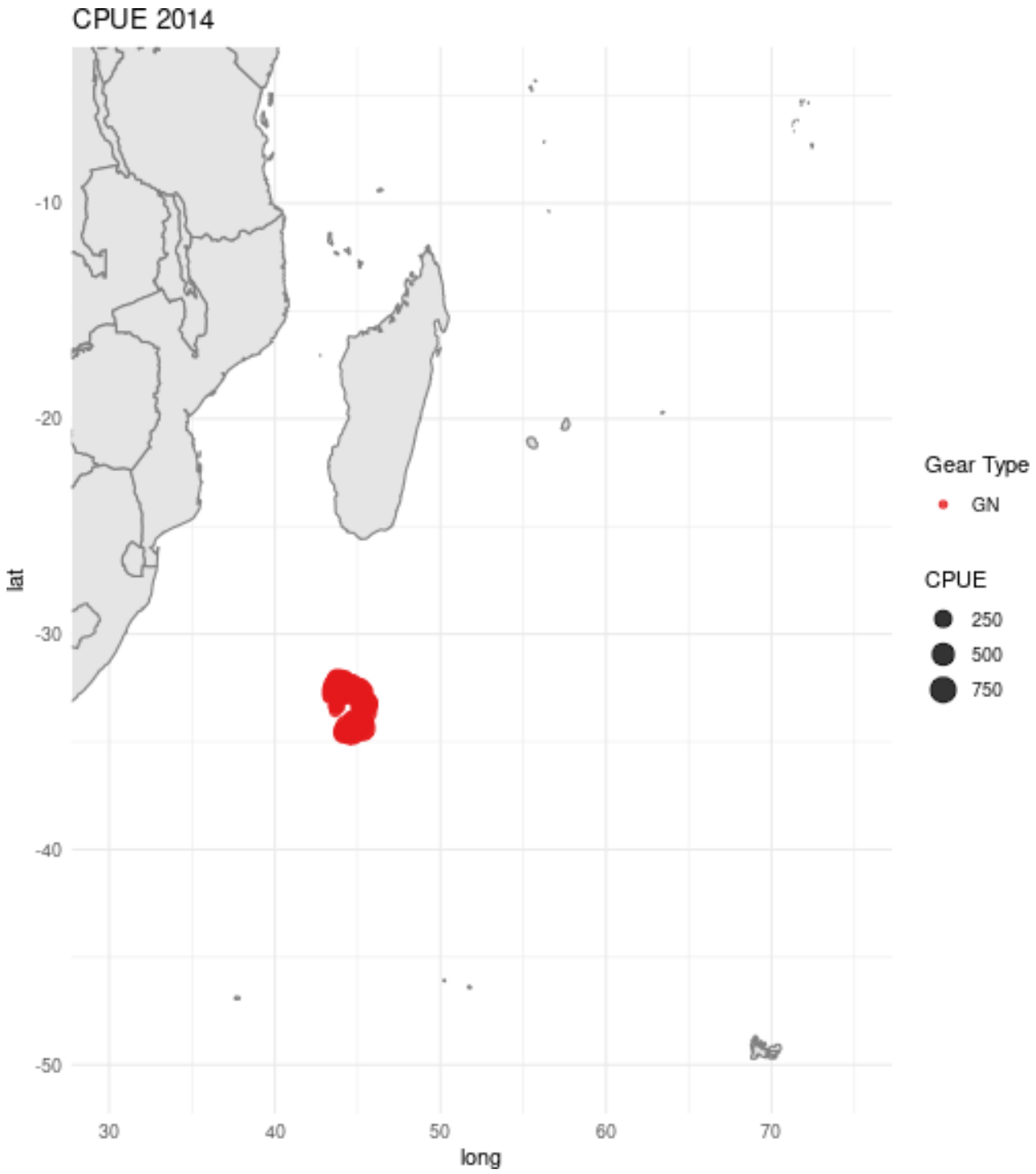
	GN	LLS
2004	0	210
2007	0	1
2008	224	0
2009	56	0
2013	190	0
2014	172	0
2015	40	132
2016	0	190
2017	0	111
2018	0	157
2019	0	169
2020	0	102
2021	0	138
2022	0	149

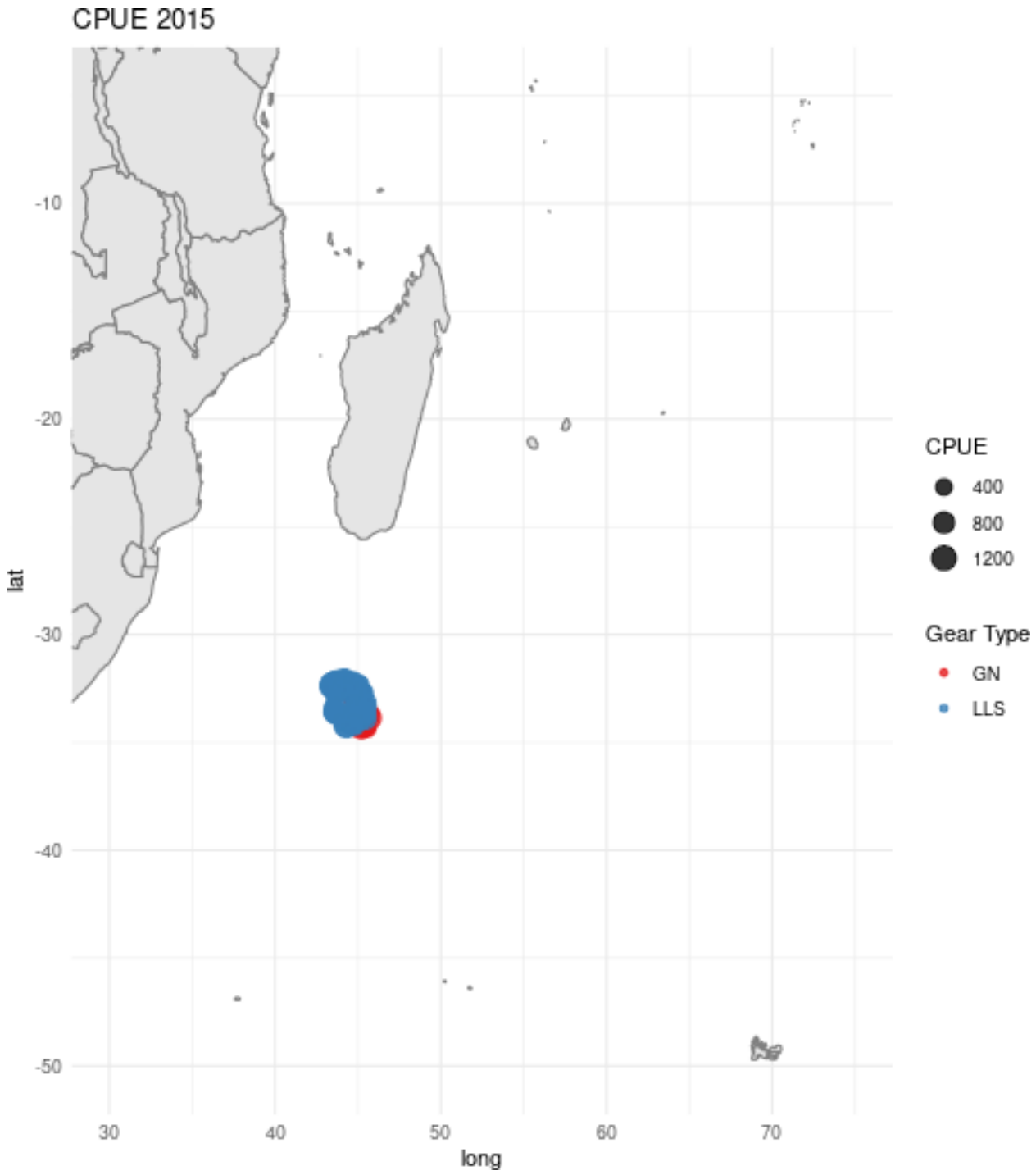

CPUE 2004
-10
-20
-30
-40
-50
lat
30
40
50
60
70
long
Gear Type
LLS
CPUE
250
500
750

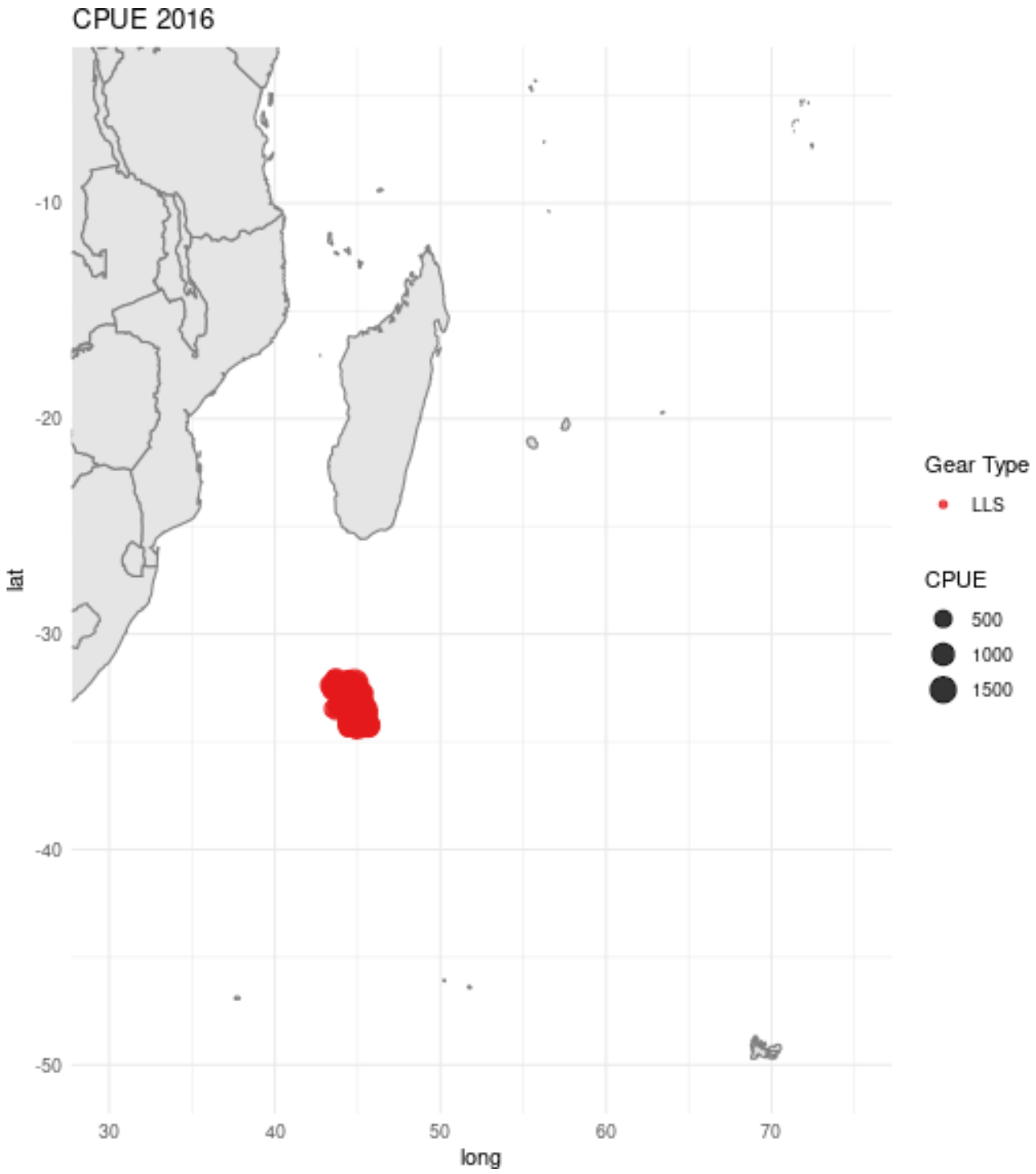

CPUE 2008
-10
-20
-30
-40
-50
lat
30
40
50
60
70
long
Gear Type
GN
CPUE
250
500
750

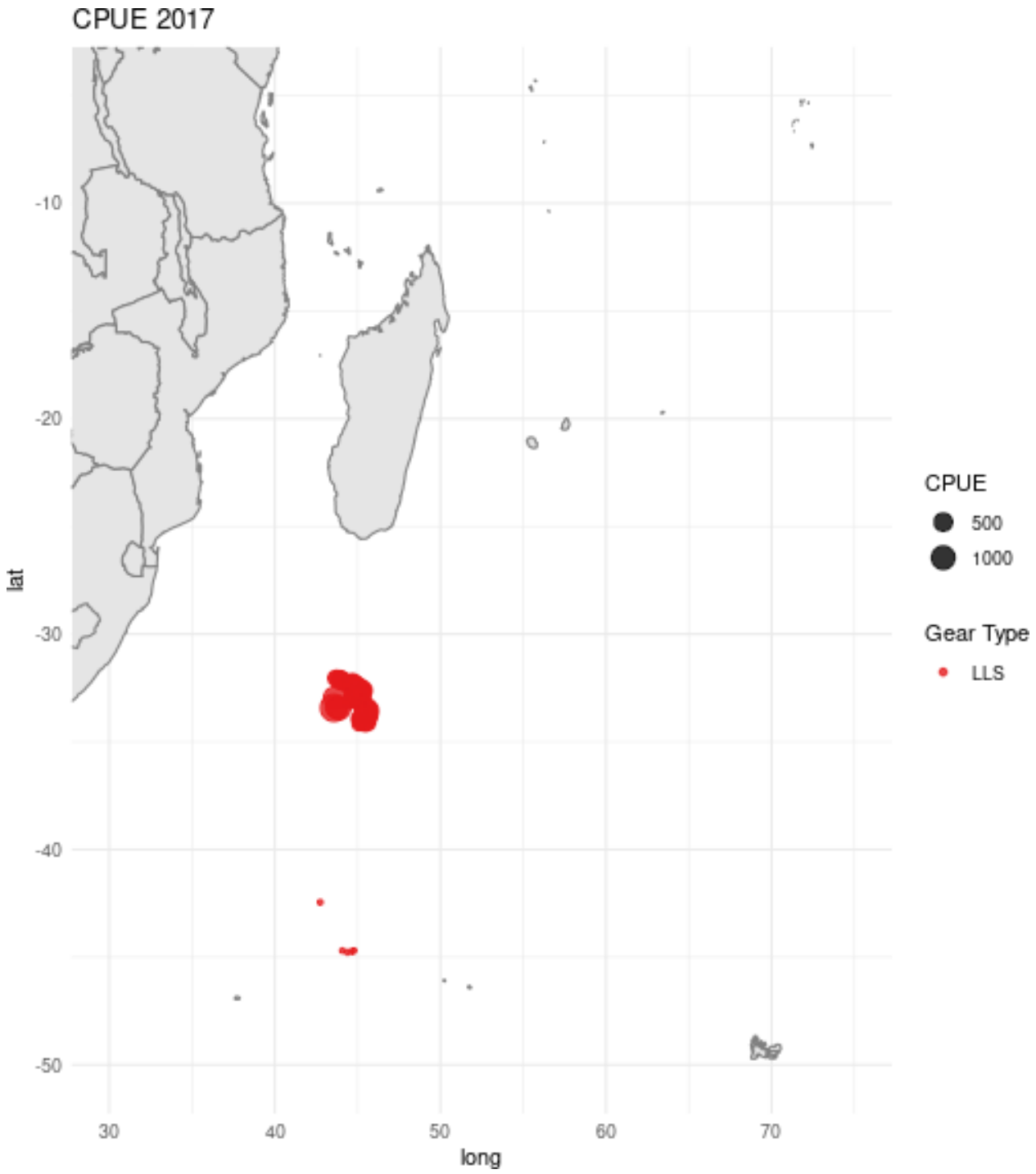

CPUE 2009
-10
-20
-30
-40
-50
lat
30
40
50
60
70
long
CPUE
100
200
300
400
500
Gear Type
GN

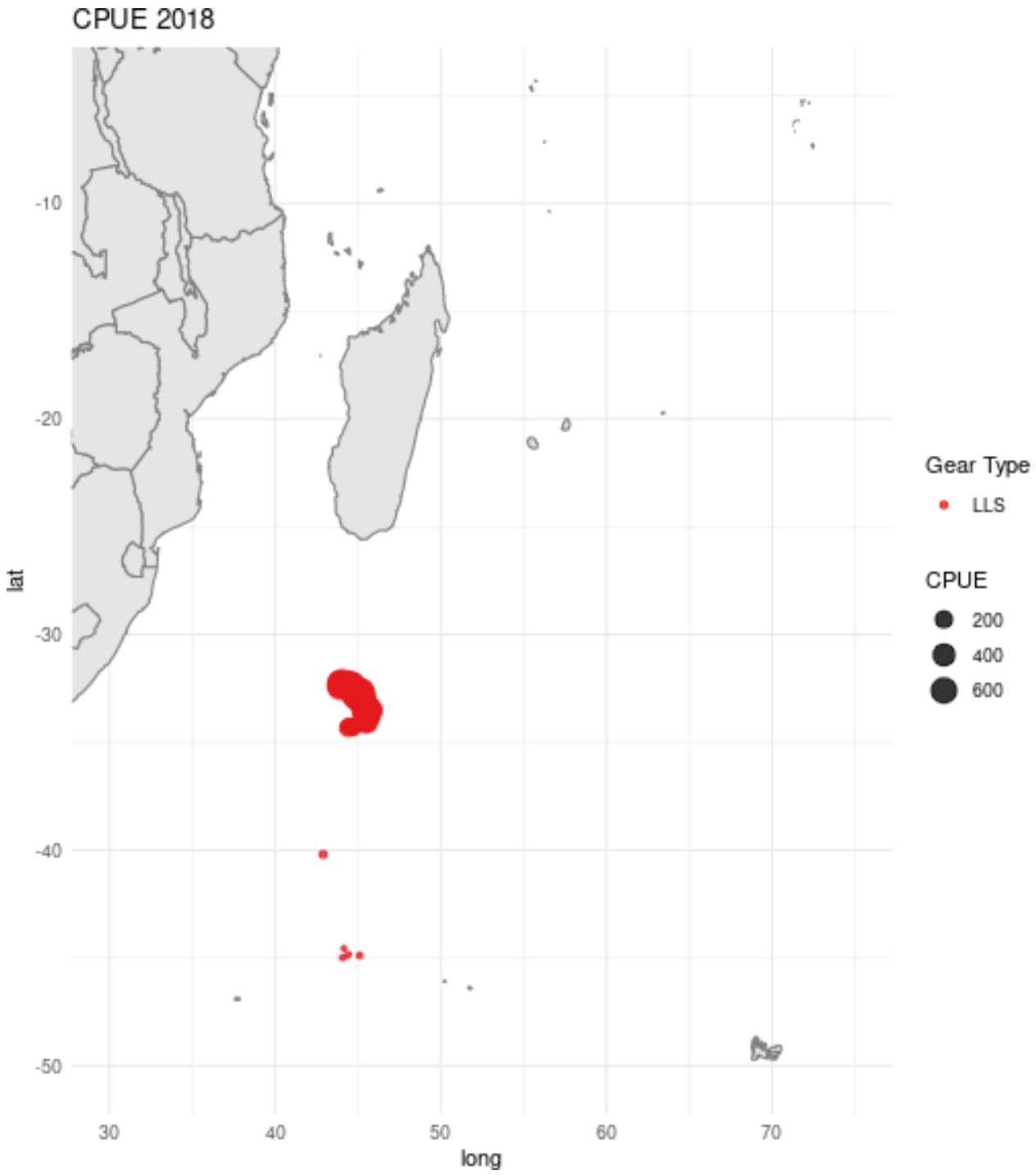

CPUE 2013
-10
-20
-30
-40
-50
lat
30
40
50
60
70
long
CPUE
200
400
600
Gear Type
GN

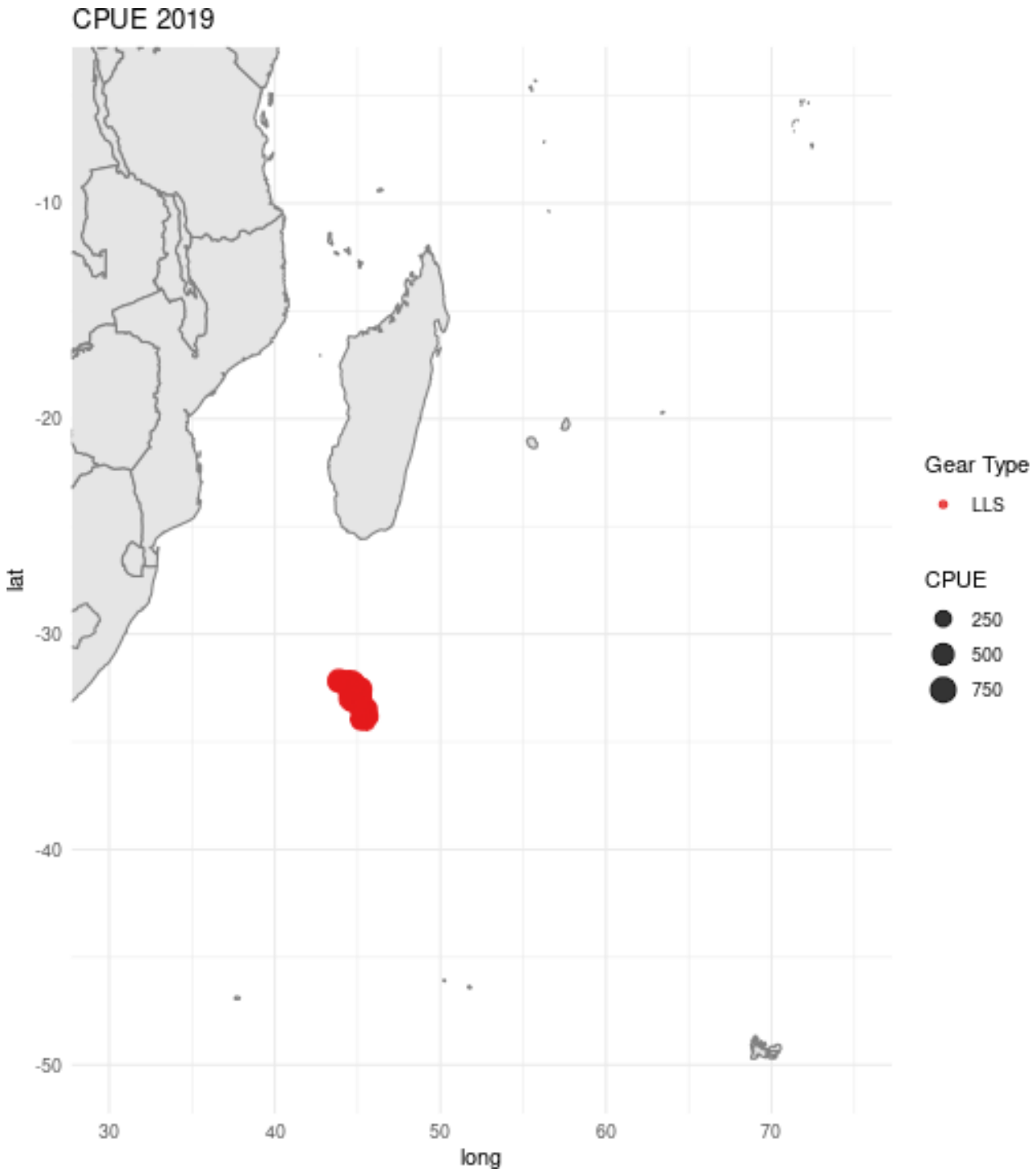

CPUE 2014
-10
-20
-30
-40
-50
lat
30
40
50
60
70
long
Gear Type
GN
CPUE
250
500
750

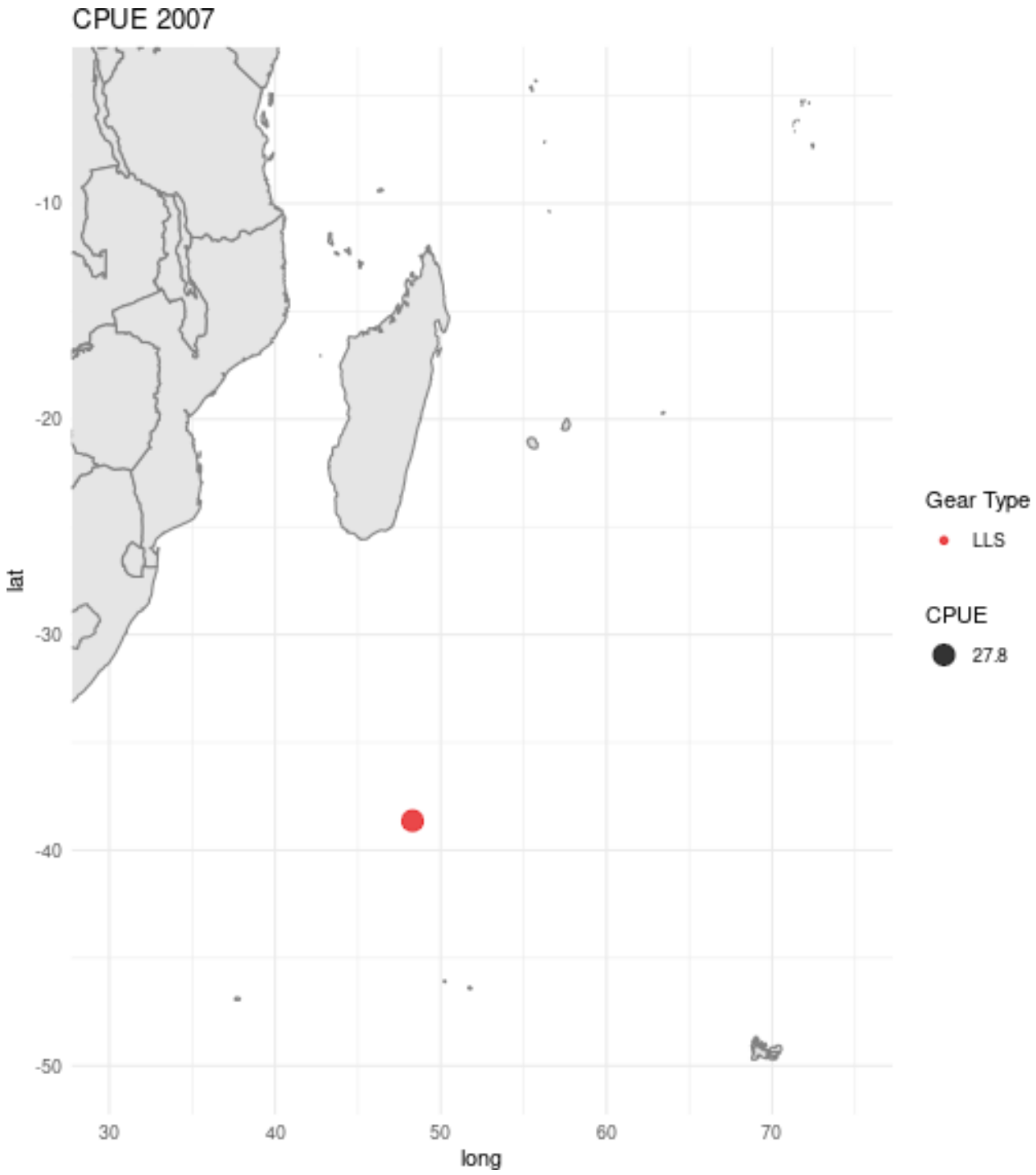

CPUE 2015
-10
-20
-30
-40
-50
lat
30
40
50
60
70
long
CPUE
400
800
1200
Gear Type
GN
LLS

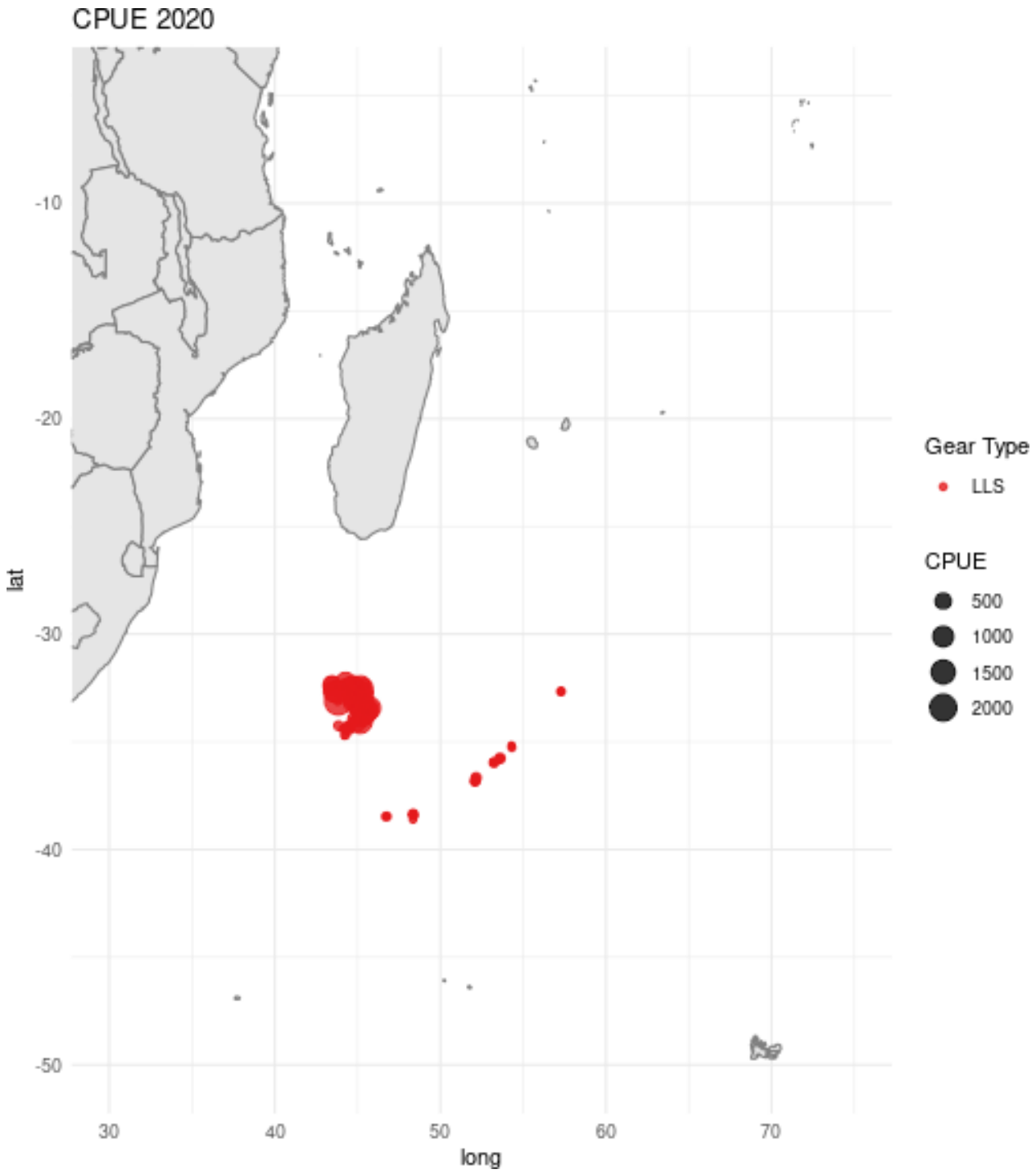

CPUE 2016
-10
-20
-30
-40
-50
lat
30
40
50
60
70
long
Gear Type
LLS
CPUE
500
1000
1500

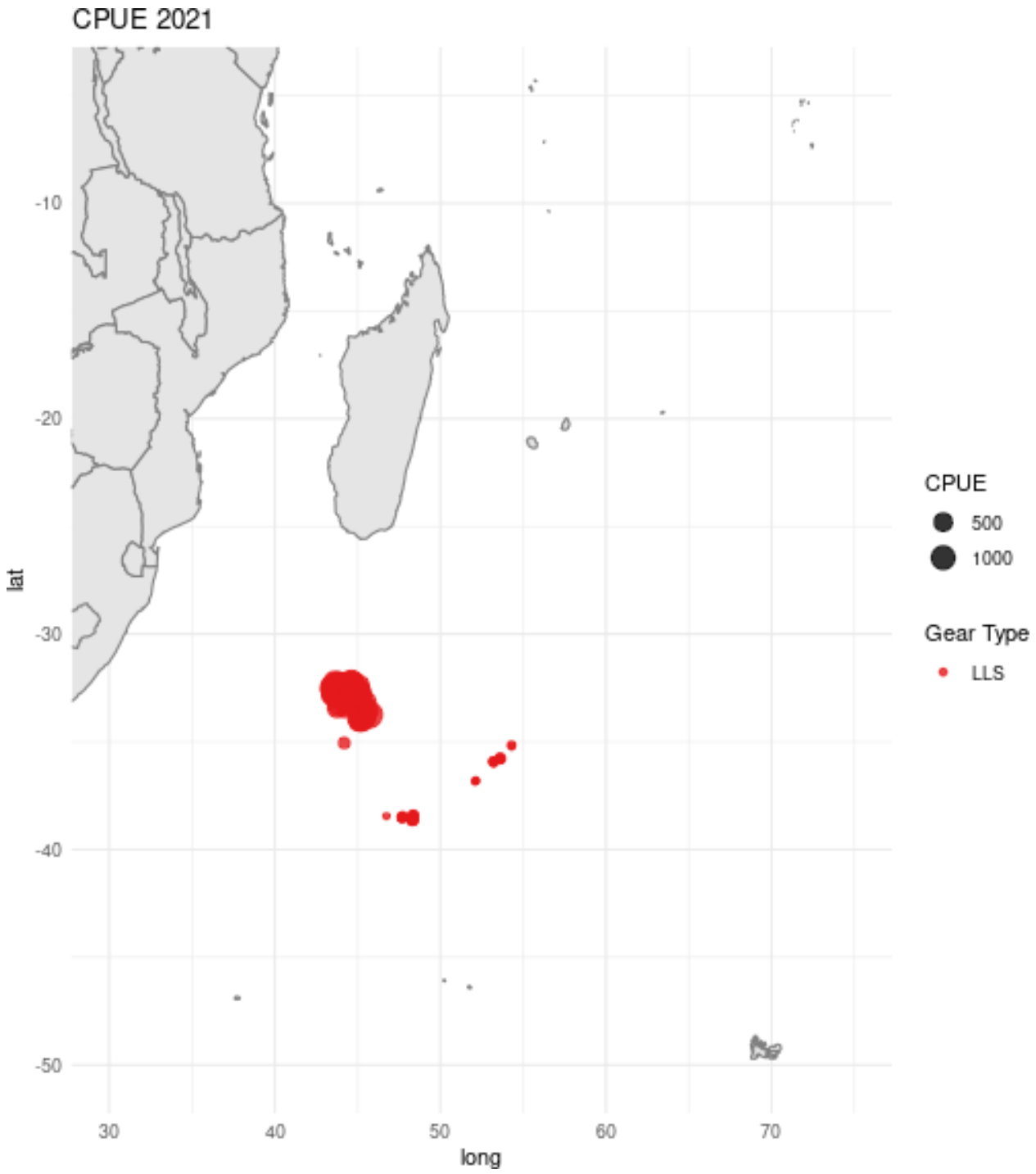

CPUE 2017
-10
-20
-30
-40
-50
lat
30
40
50
60
70
long
CPUE
500
1000
Gear Type
LLS

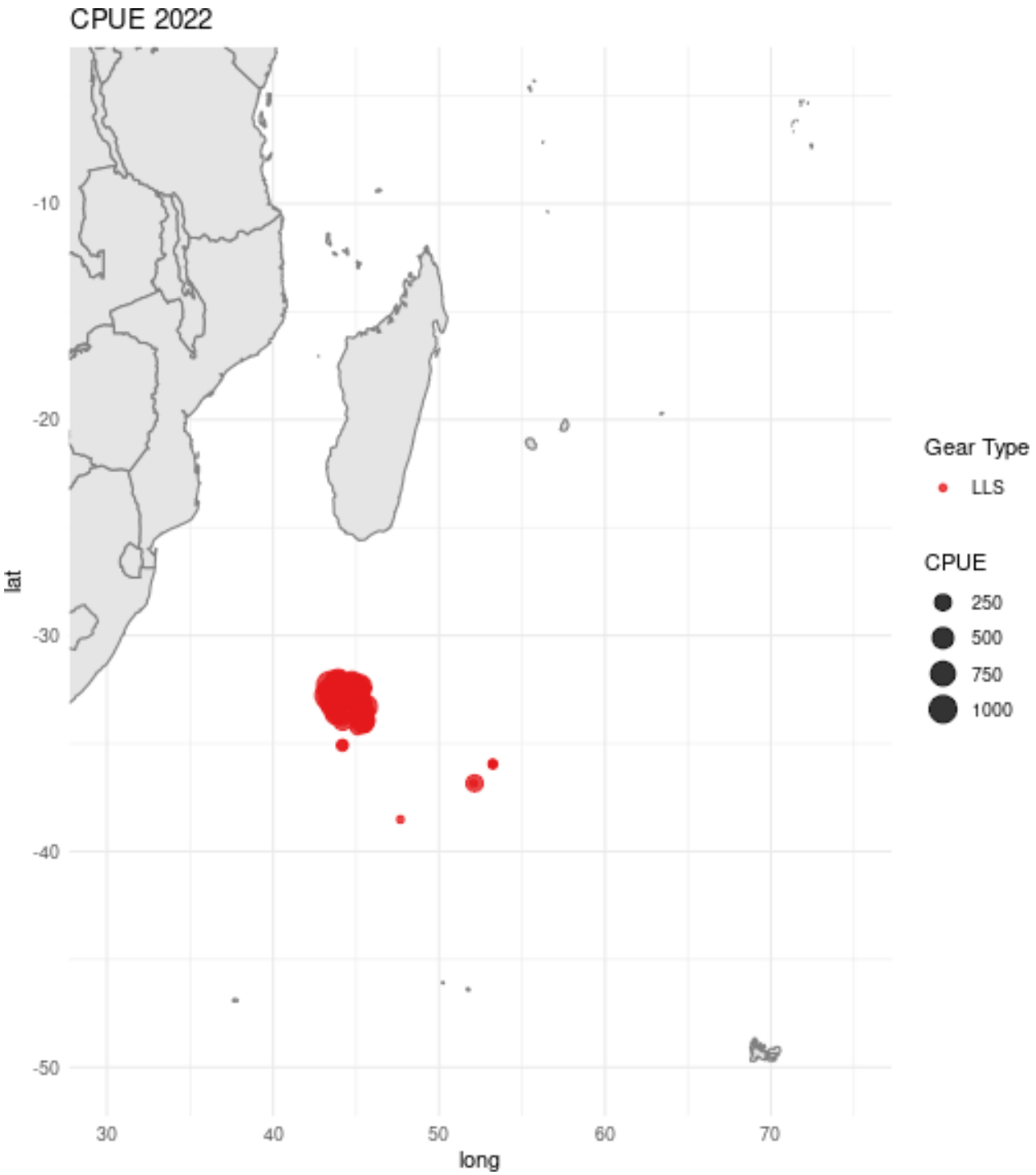

CPUE 2018
-10
-20
-30
-40
-50
lat
30
40
50
60
70
long
Gear Type
LLS
CPUE
200
400
600


CPUE 2019
-10
-20
-30
-40
-50
lat
30
40
50
60
70
long
Gear Type
LLS
CPUE
250
500
750

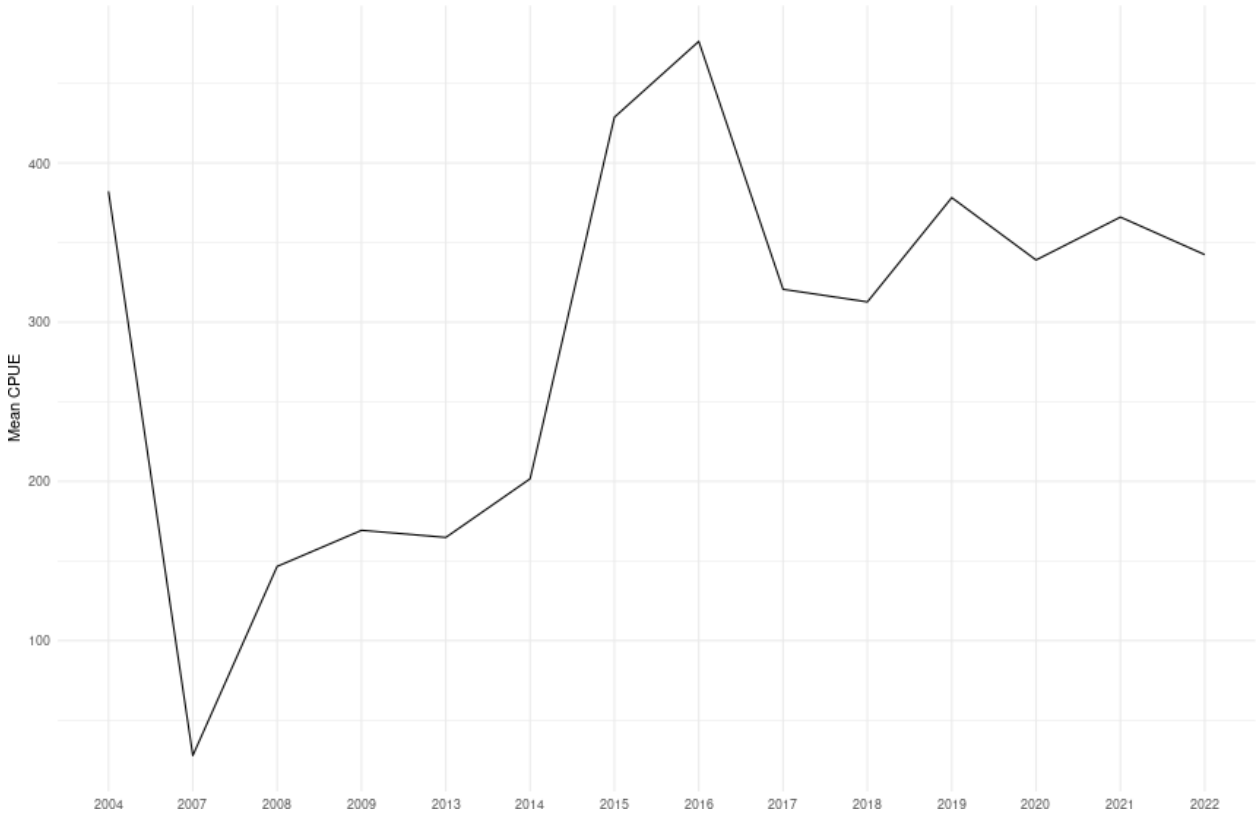

CPUE 2007
-10
-20
-30
-40
-50
lat
30
40
50
60
70
long
Gear Type
LLS
CPUE
27.8


CPUE 2020
-10
-20
-30
-40
-50
lat
30
40
50
60
70
long
Gear Type
LLS
CPUE
500
1000
1500
2000

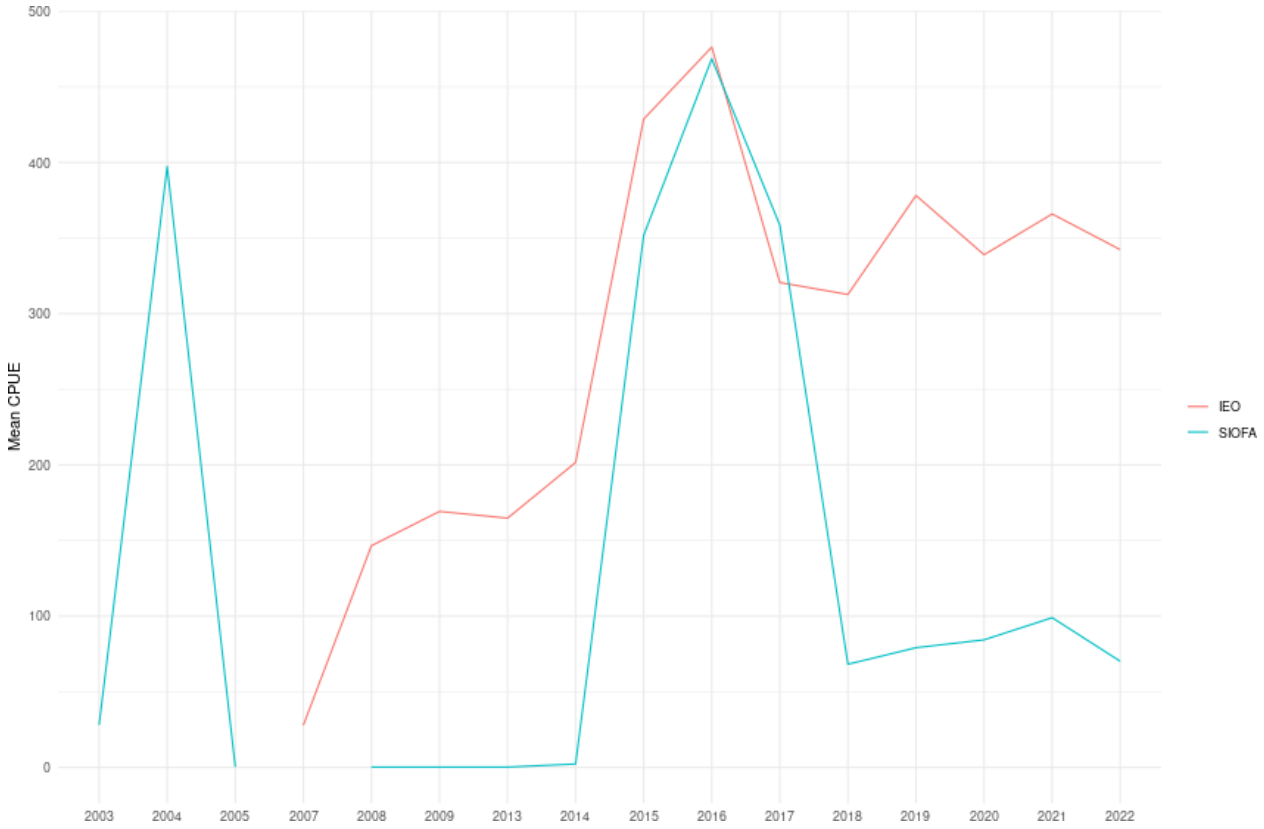

CPUE 2021
-10
-20
-30
-40
-50
lat
30
40
50
60
70
long
CPUE
500
1000
Gear Type
LLS



For Portugese dogfish, there's only data available for 1 gear type in the different years. Data is available for longlines in 2004 and from 2015-2022. Gillnet CPUEs are available for years 2008-2014



For most years, there's only data available from 1 gear type in both datasets. Combining CPUEs from multiple gear types could be done using a generalized additive model (GAM) in which the different gear types can be taken into account. However, when there is no data available on catches and/or effort from different gear types within a year, it is not possible to run such a model to derive a reliable estimate of relative abundance.


Mean CPUE
500
400
300
200
100
0
2003
2004
2005
2007
2008
2009
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
IEO
SIOFA