# Comparison of all fleets in the main stock assessment area in the eastern Pacific Ocean

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*WORKSHOP TO IMPROVE THE LONGLINE INDICES OF ABUNDANCE OF BIGEYE AND YELLOWFIN TUNAS IN THE EASTERN PACIFIC OCEAN*

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**DOCUMENT SAC-08-07b**

# A PRELIMINARY METADATA ANALYSIS OF LARGE-SCALE TUNA LONGLINE FISHERY DATA IN THE EASTERN PACIFIC OCEAN: A PRECURSOR TO ECOLOGICAL RISK ASSESSMENT

Shane Griffiths and Leanne Duffy

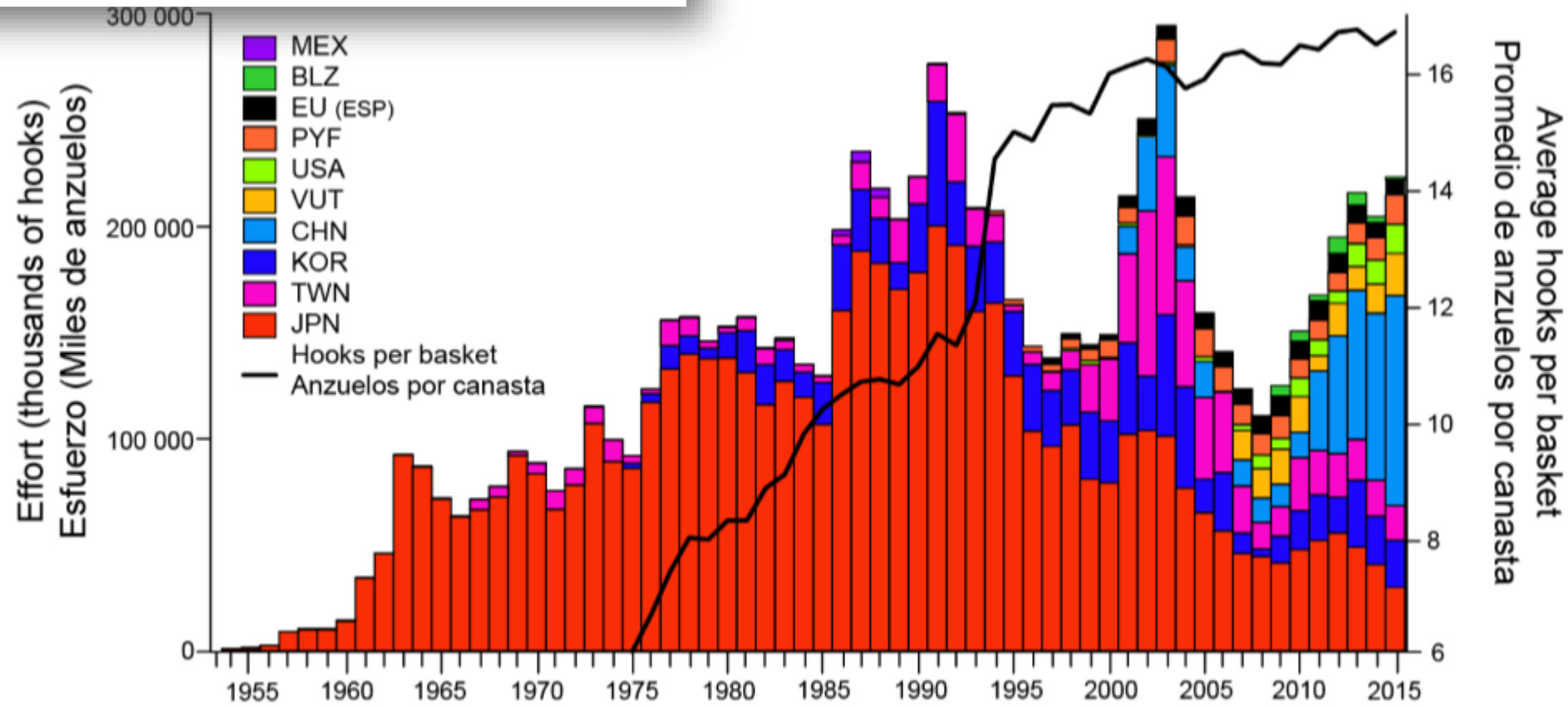
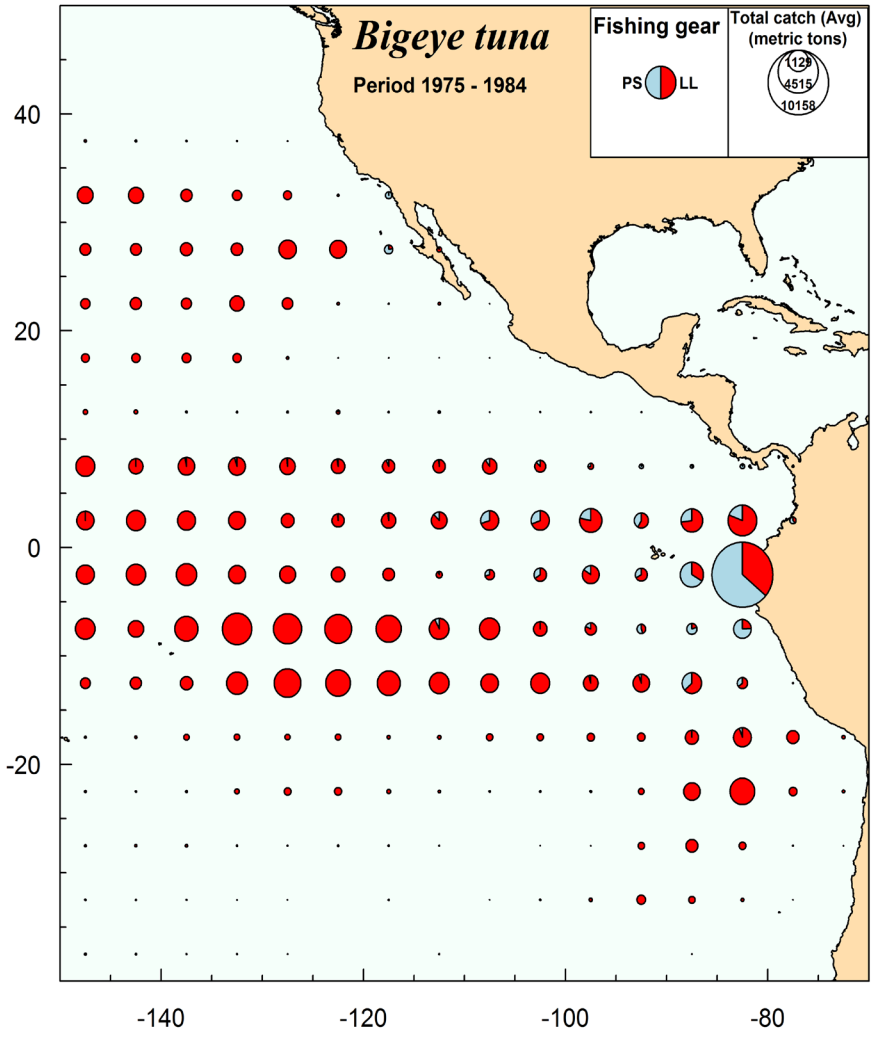


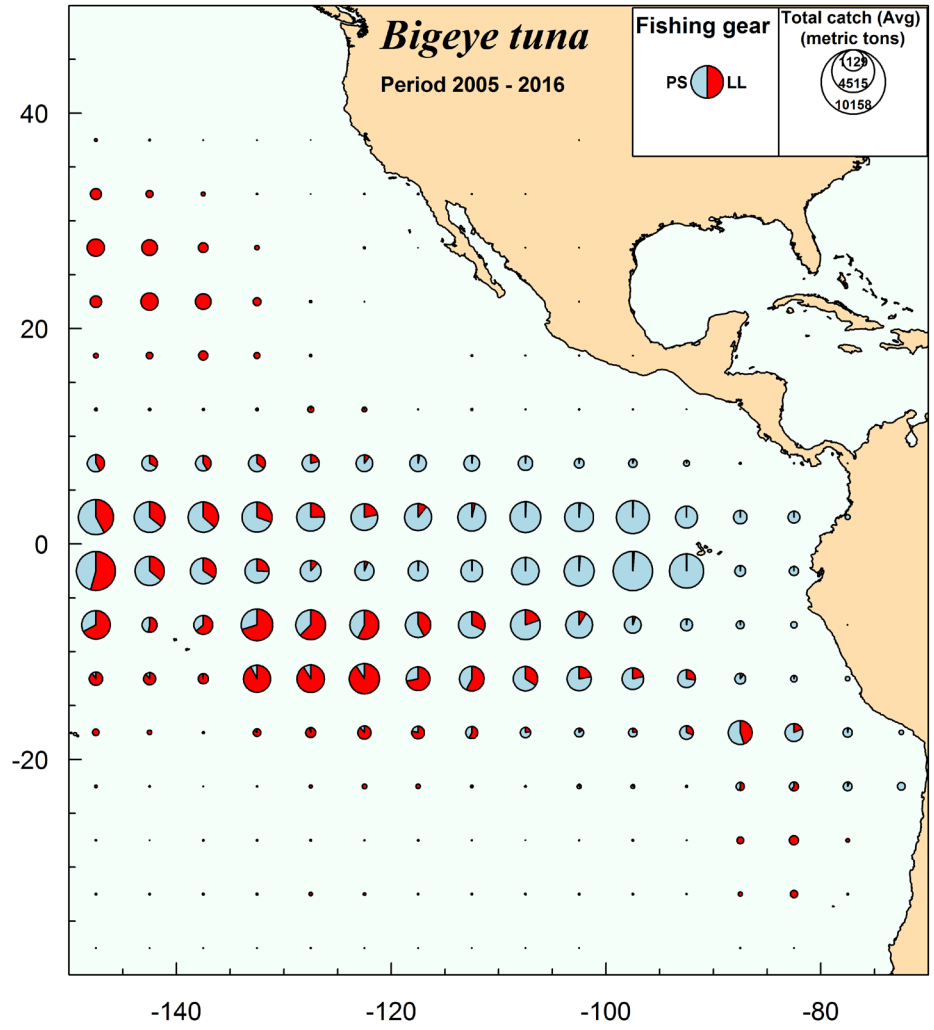

**FIGURE 1.** Annual fishing effort, in thousands of hooks, in the large-scale tuna longline fishery, by CPC (left y-axis), and annual average number of hooks per basket for the Japanese longline fleet (right y-axis), in the eastern Pacific Ocean, 1953-2015.

SAC-08-07b

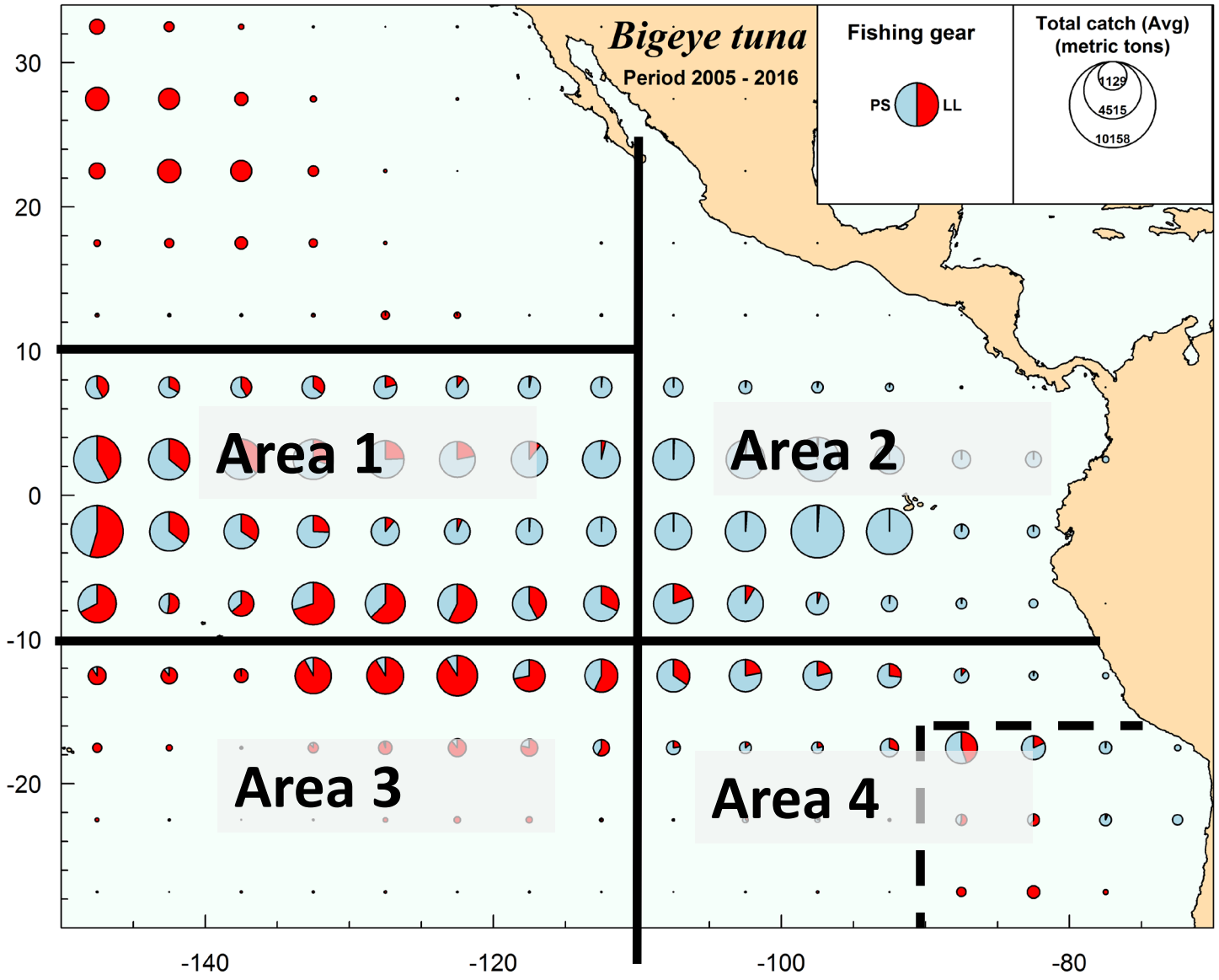
## 1975-1984




## 2005-2016



# Proposal for spatial assumptions




**Support**:

**PS**: PS-OBJ LF data

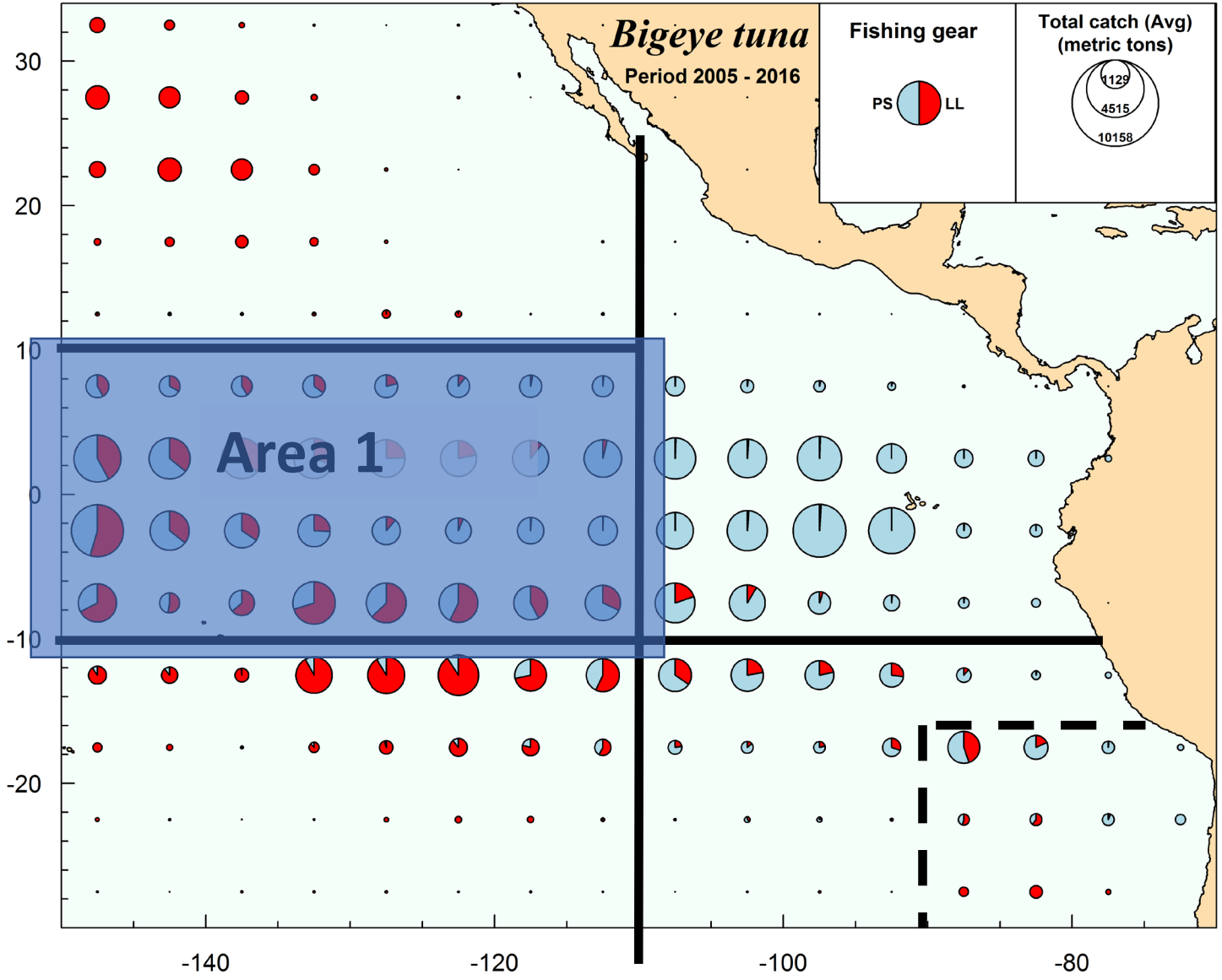
**LL**: early LL data

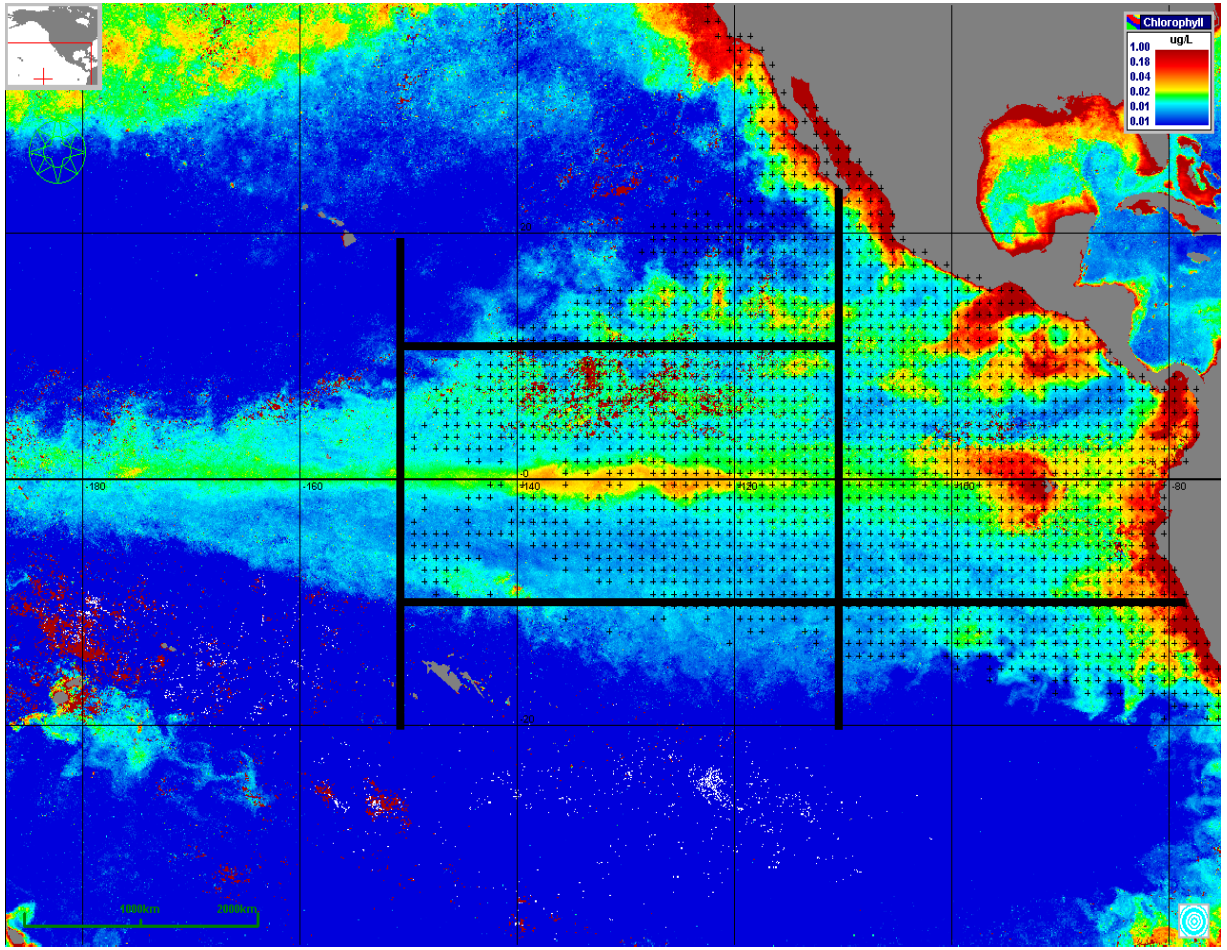
**A:** Quarterly anomaly in JPN LL CPUE

**p** – practical consideration

**Definition of two fisheries for LL and two fisheries for PS (LL, PS)**

# Area for the comparison among fleets



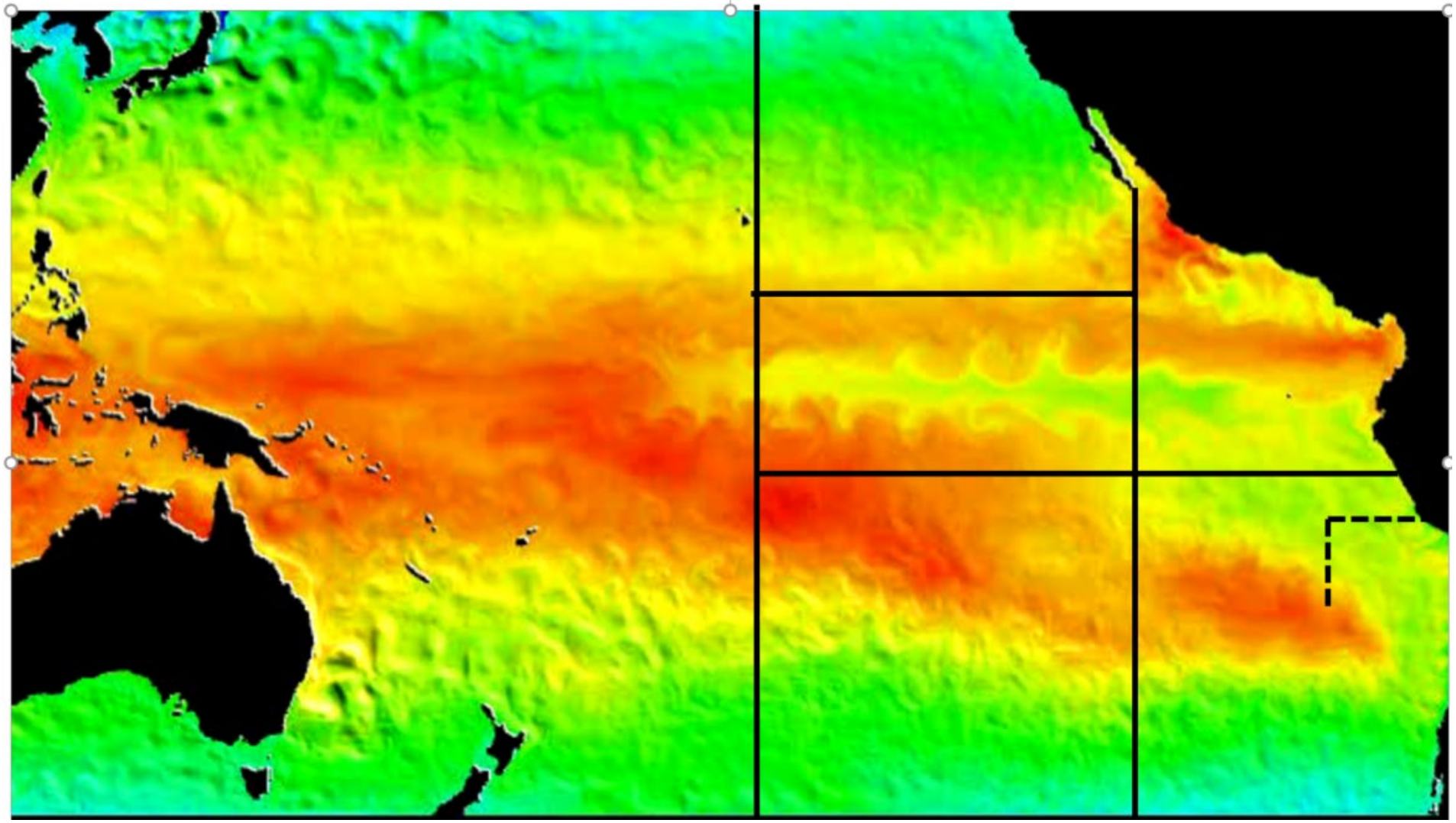



**Primary productivity: 5N, 17N and east west at 120:** The areas of higher primary productivity the EPO are the areas of upwelling close to the coast, west of the Galapagos Islands and further west of them, around the equator.

Chlorophyll-a concentrations in February, 2007, as measured by the Moderate-Resolution Imaging Spectroradiometer (MODIS). (image: EASy/SpatialAnalysis)

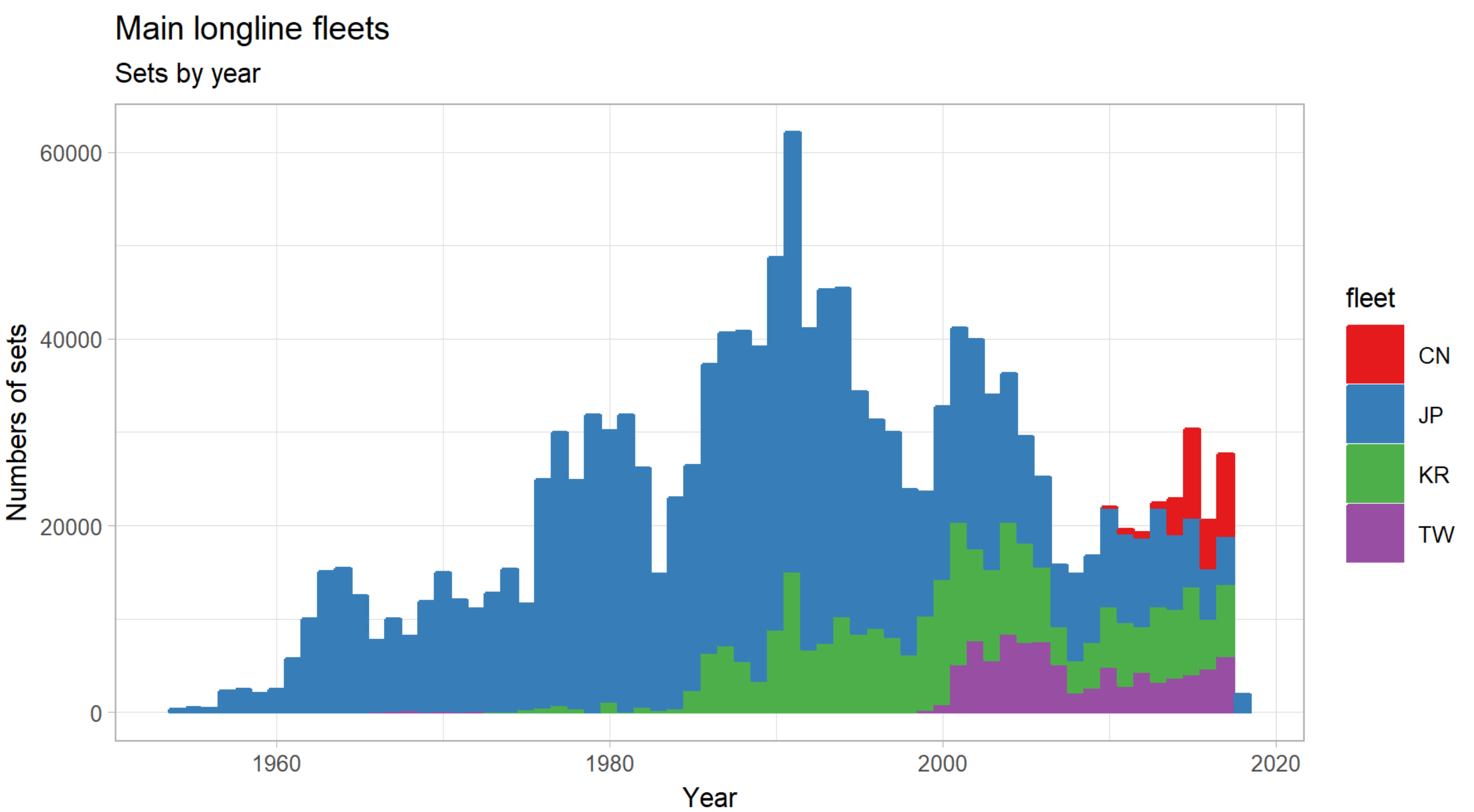
Hinton 2015

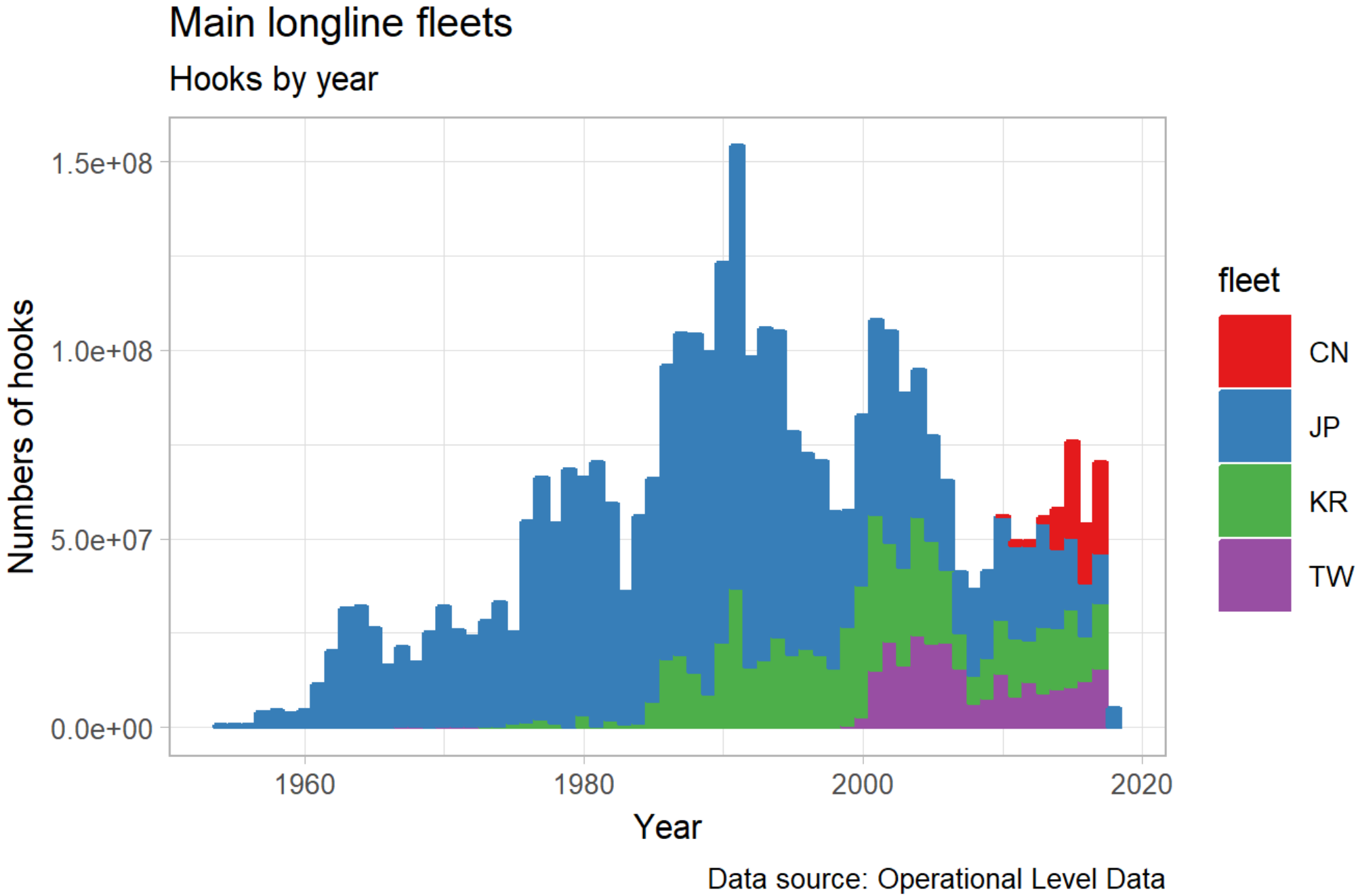
# Oceanography

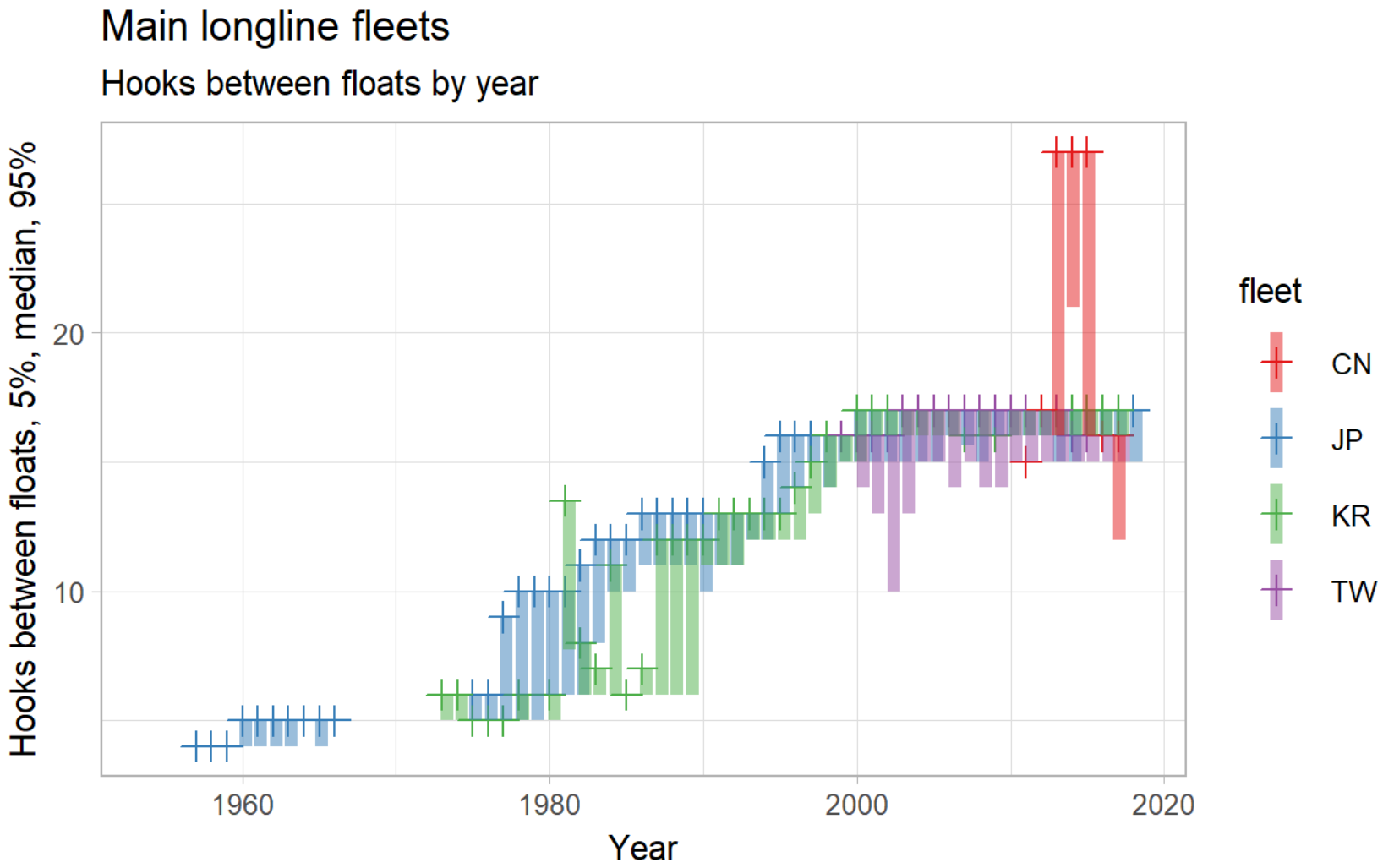


# General comparisons

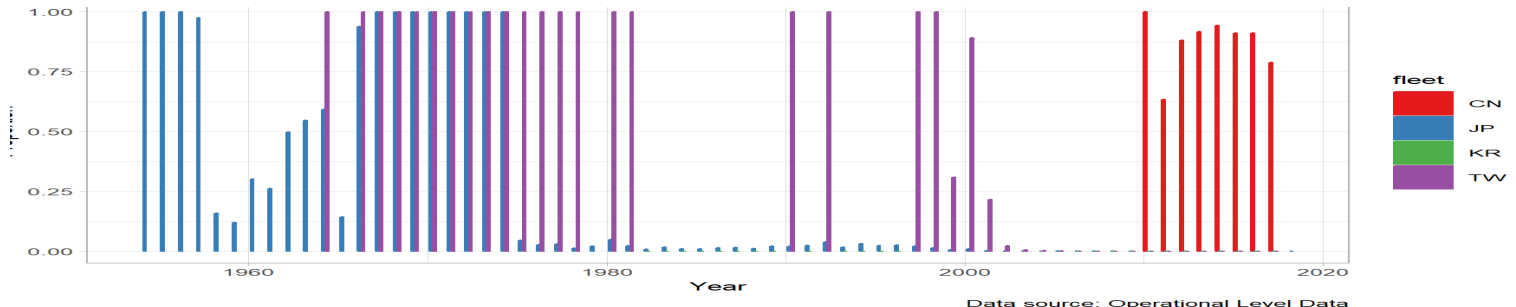
| | Number of sets | Year start | Year end |
|---|---|---|---|
| Japan | 1,078,051 | 1954 | 2018 |
| Korea | 267,776 | 1971 | 2017 |
| Taiwan | 88,692 | 1964 | 2017 |
| China | 28,254 | 2010 | 2017 |


Main longline fleets
Sets by year
Numbers of sets
60000
40000
20000
0
1960
1980
2000
2020
Year
fleet
CN
JP
KR
TW
Data source: Operational Level Data

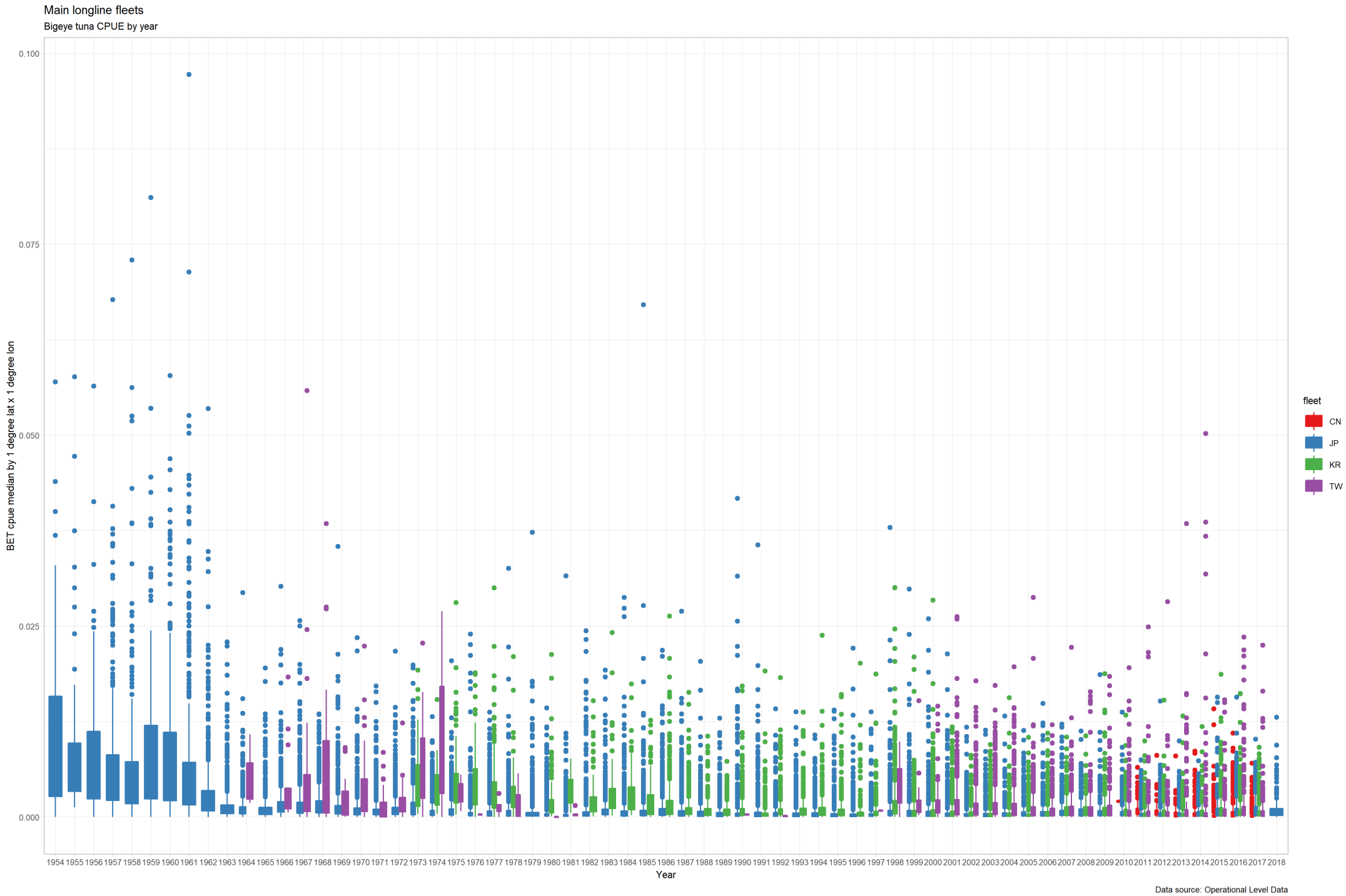

Main longline fleets
Hooks by year
Numbers of hooks
1.5e+08
1.0e+08
5.0e+07
0.0e+00
1960
1980
2000
2020
Year
fleet
CN
JP
KR
TW
Data source: Operational Level Data




Proportion of sets with no hbf information



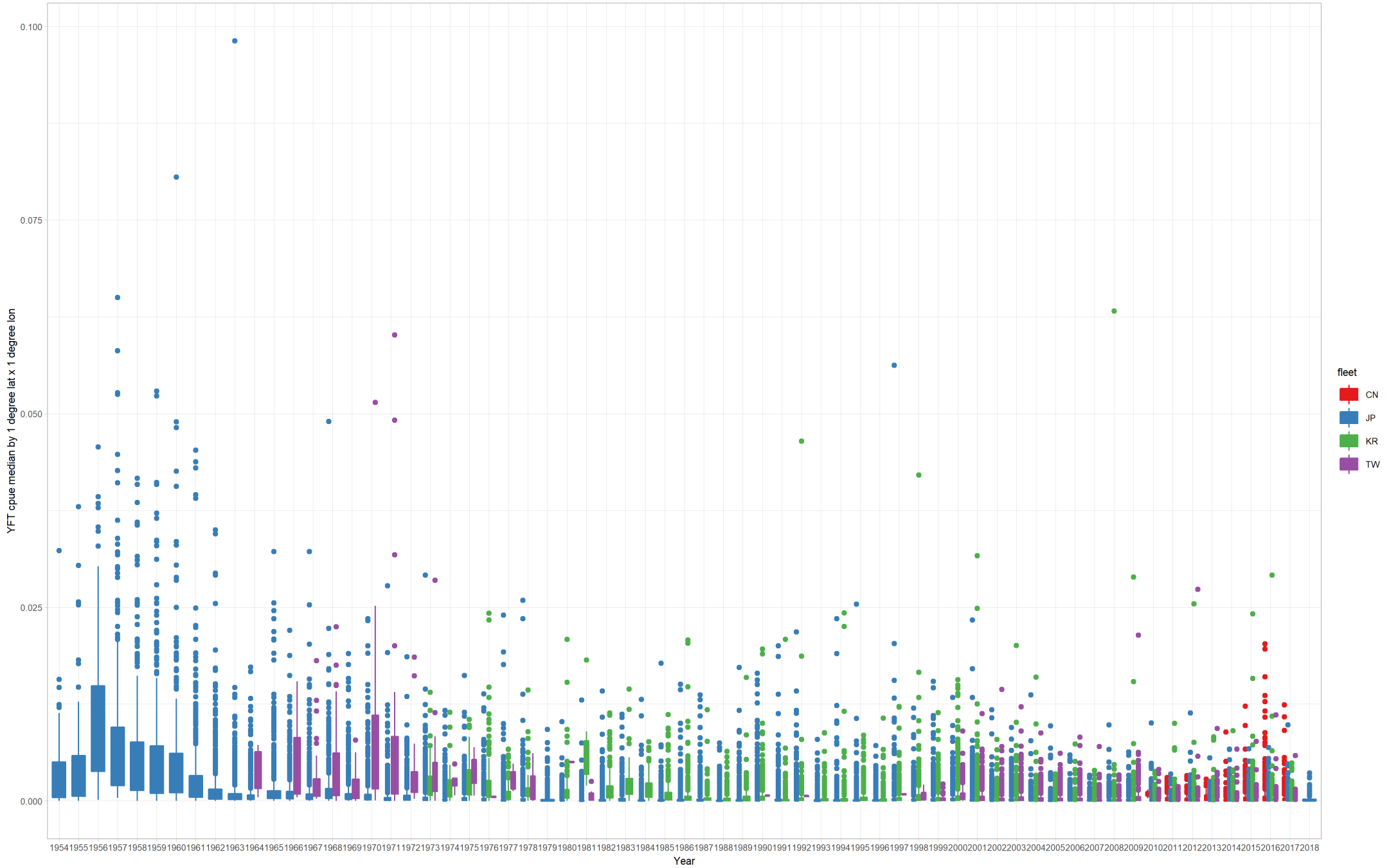
# BET


Main longline fleets
Bigeye tuna CPUE by year
BET cpue median by 1 degree lat x 1 degree lon
0.100
0.075
0.050
0.025
0.000
1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018
Year
fleet
CN
JP
KR
TW
Data source: Operational Level Data

# YFT

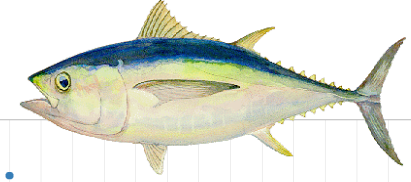
Main longline fleets

Bigeye tuna CPUE by year




Data source: Operational Level Data

# BET



Main longline fleets

Bigeye tuna CPUE by year

1975 2000 2010

Log (Longline CPUE)

BET cpue median by 1 degree lat x 1 degree lon

-2.5 -5.0 -7.5 -10.0 -12.5

1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018

Year

fleet

China

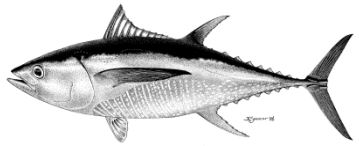
Japan

Korea

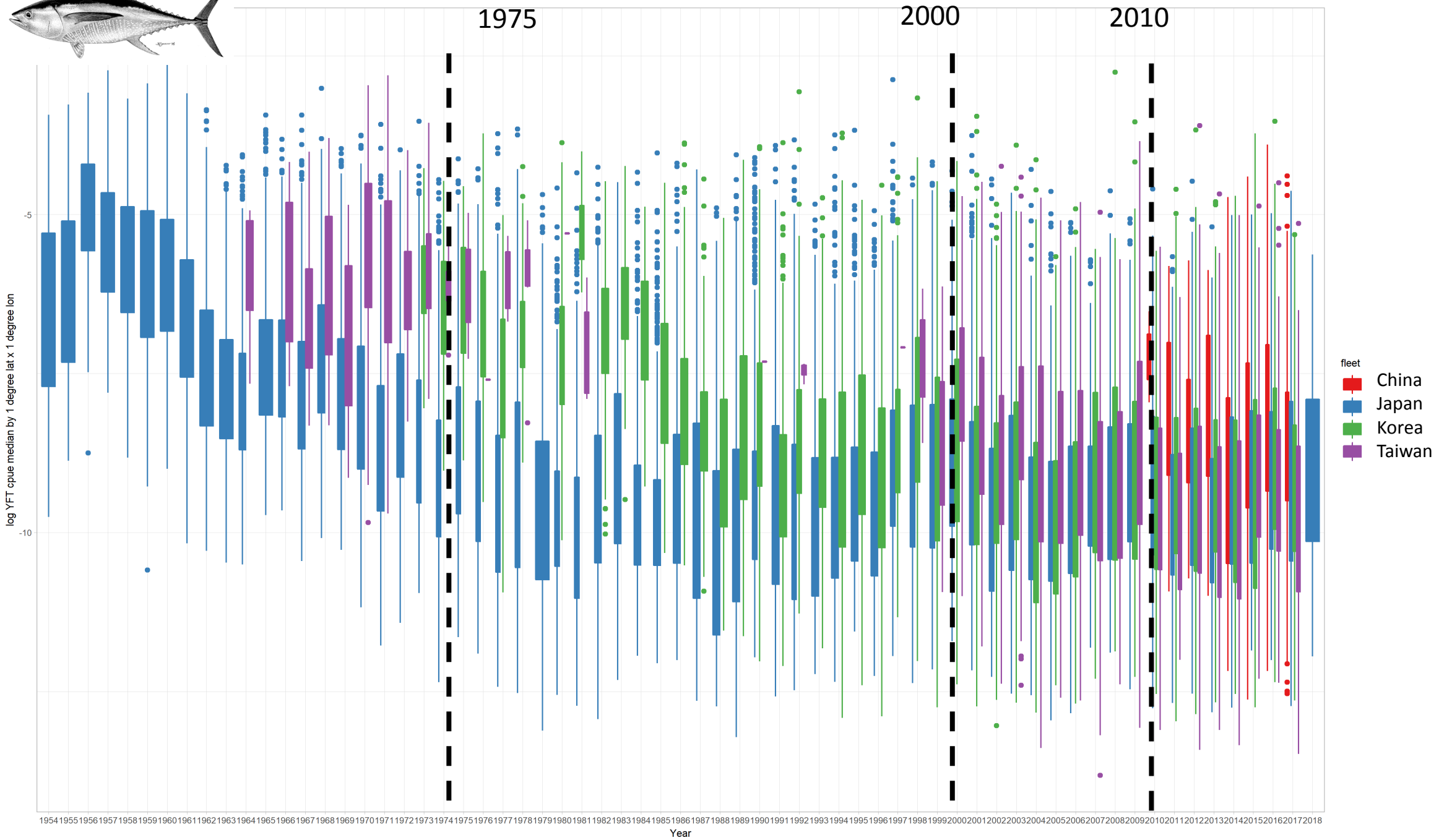
Taiwan

Data source: Operational Level Data

# YFT

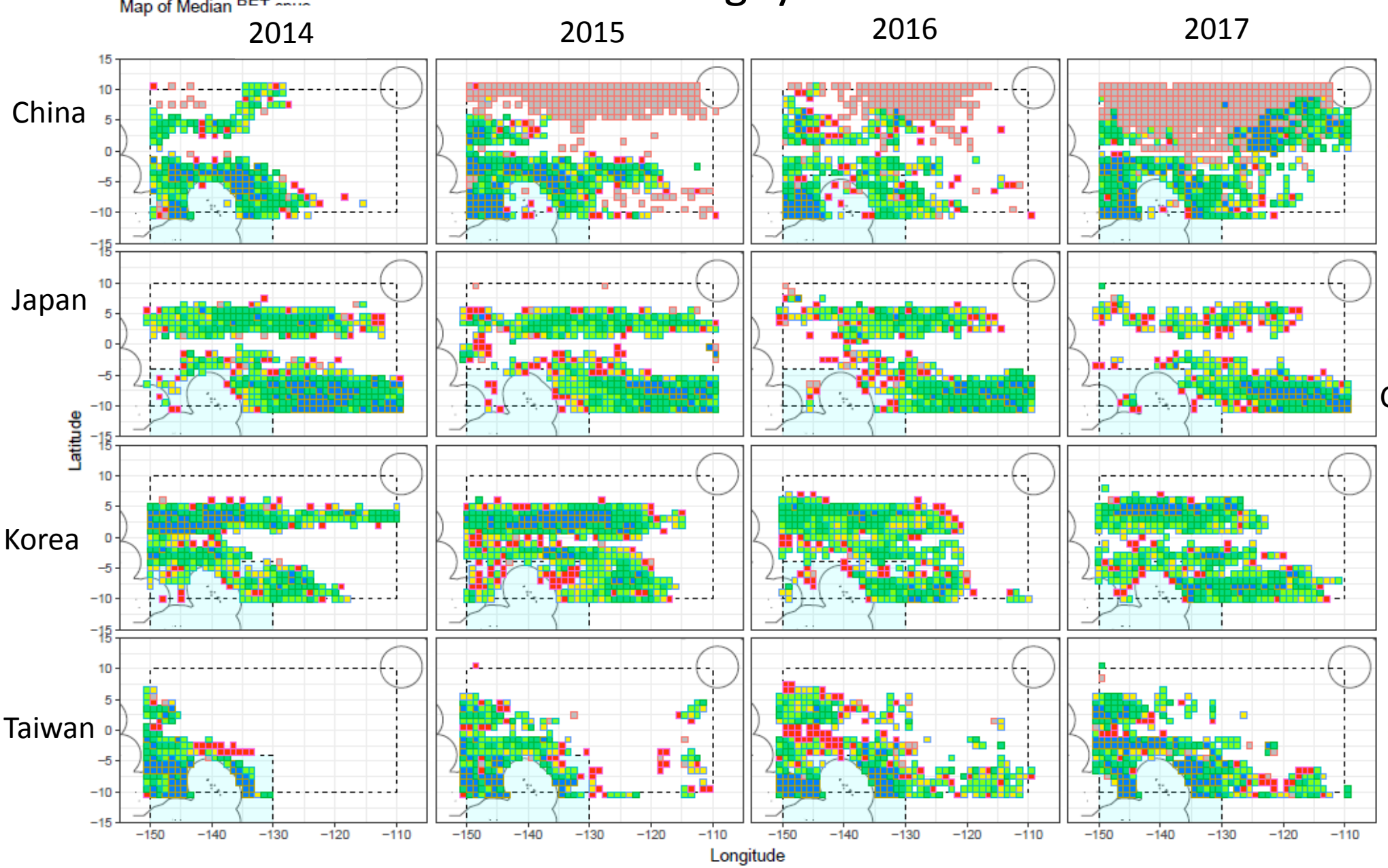


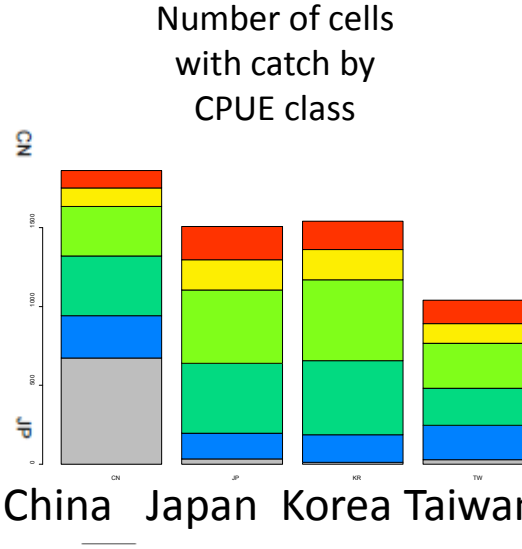
Log (Longline CPUE)

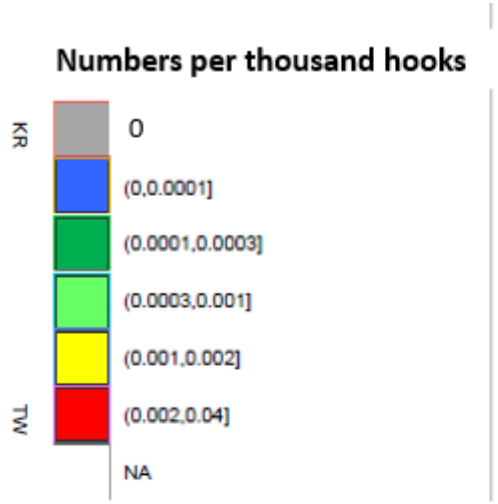



Data source: Operational Level Data

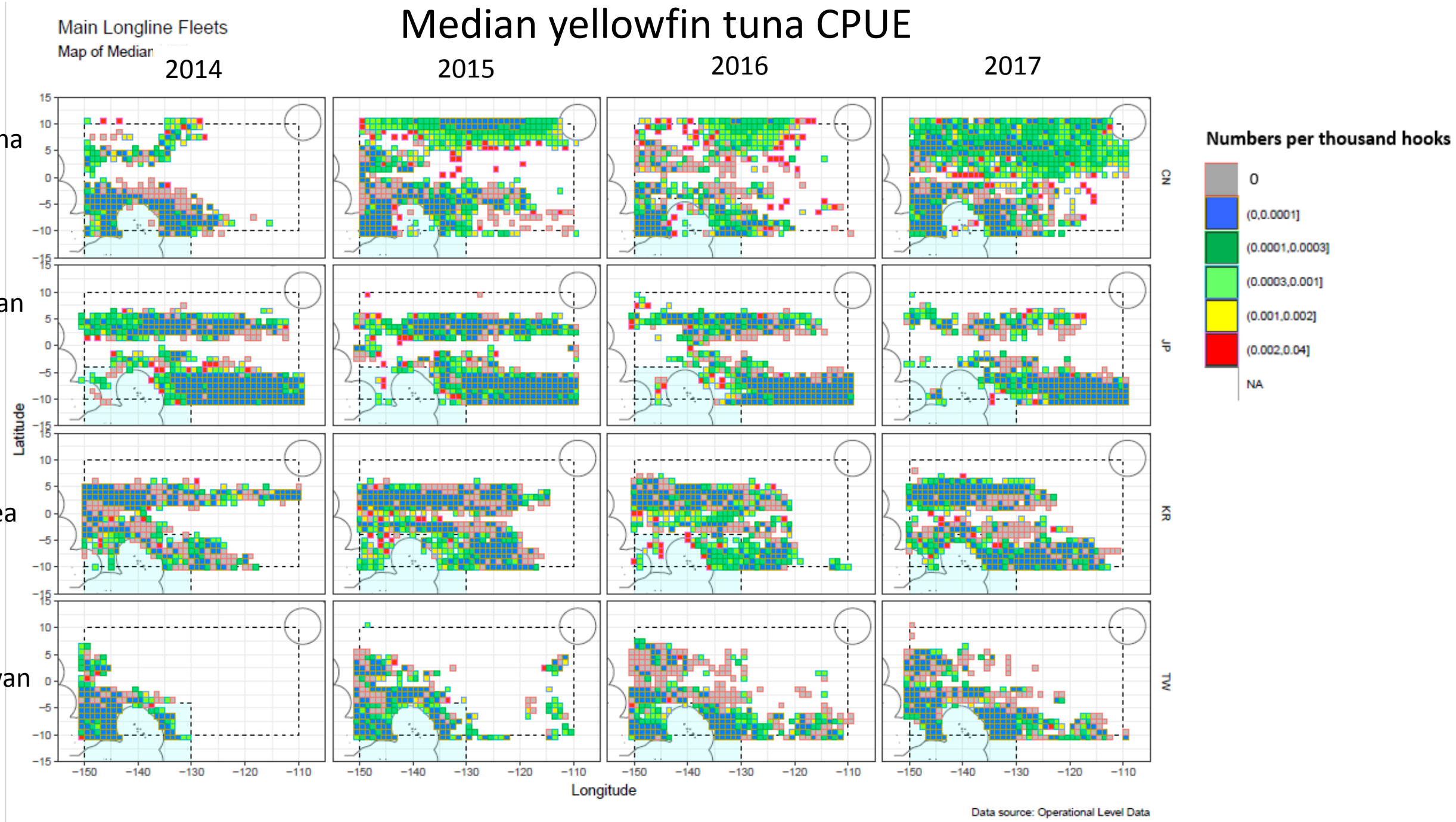
# Median bigeye tuna CPUE



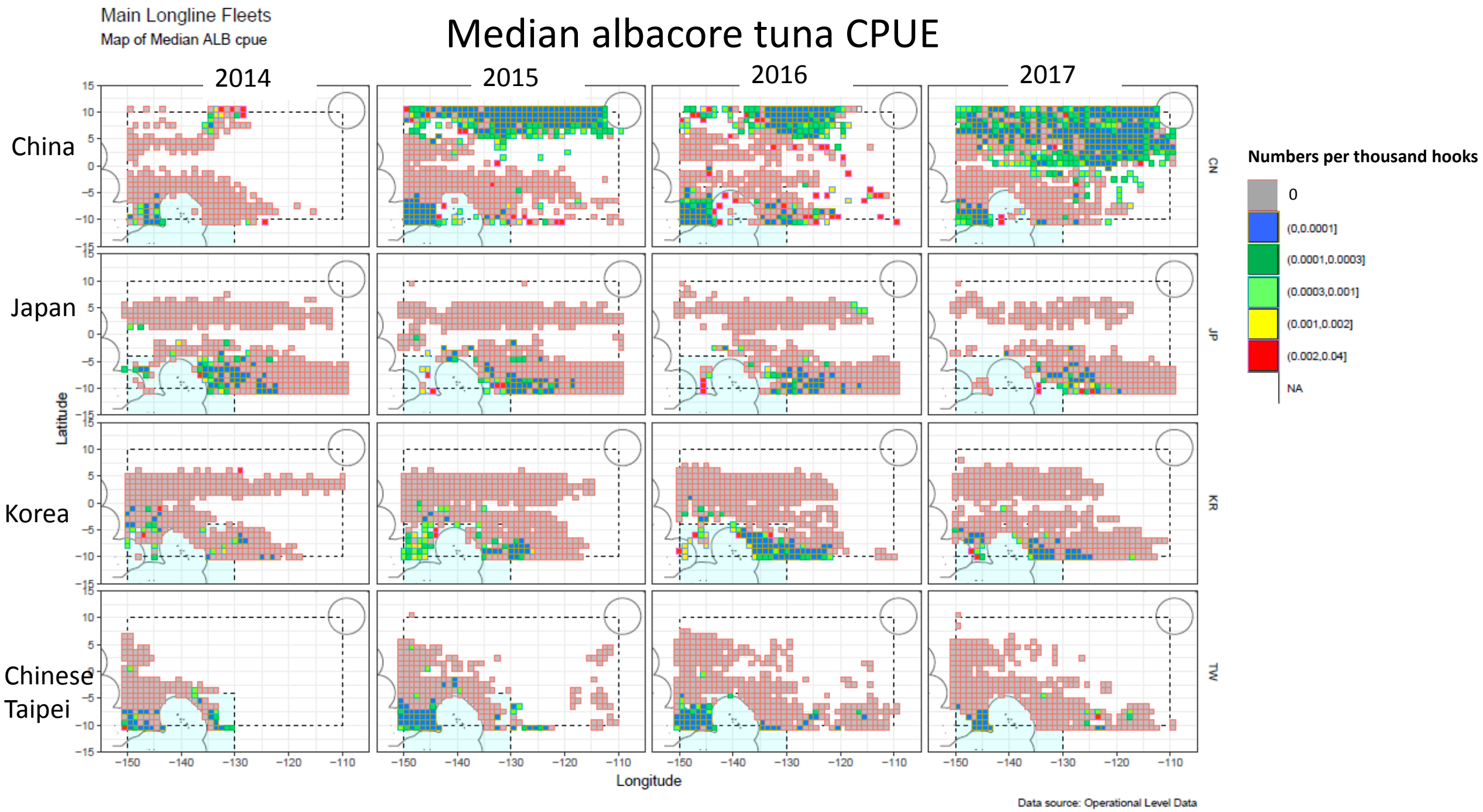



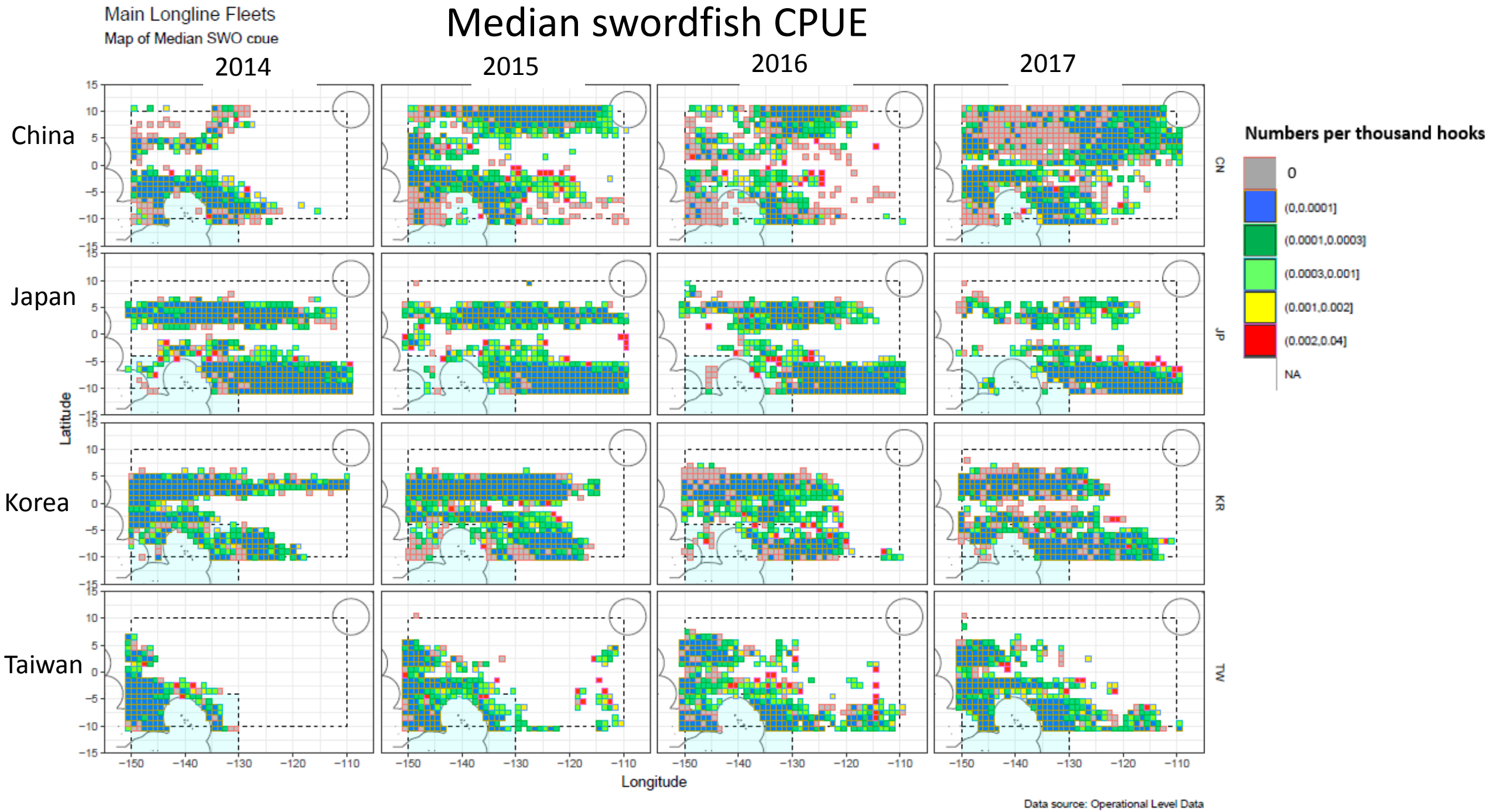
# Median yellowfin tuna CPUE



# Median albacore tuna CPUE



# Median swordfish CPUE



# Thank you!