



**COMMISSION
FIFTEENTH REGULAR SESSION**
Honolulu, Hawaii, USA
10 – 18 December, 2018

WCPFC_GFW-Birdlife night assessment

**WCPFC15-2018-OP18
12 December 2018
0800**

**Submitted by
Birdlife International**

CCSBT-2018-CC13-Info3

A new method using AIS data to obtain independent compliance data to determine mitigation use at sea

CCSBT Compliance Committee 13

Honolulu/Hawaii

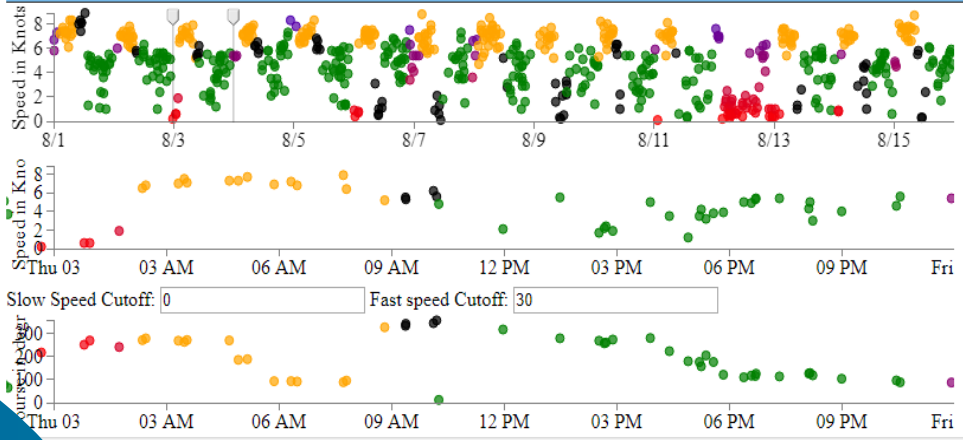
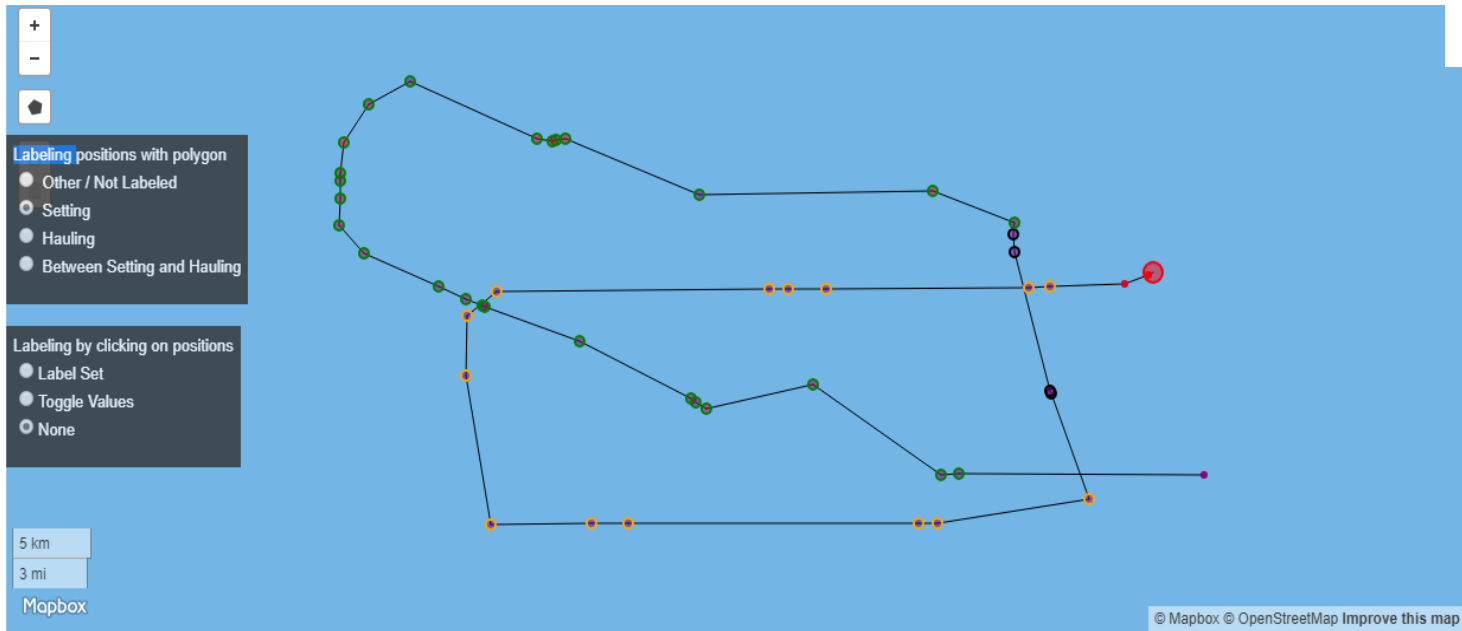
Stephanie Winnard

presented by Karen Baird Pacific Regional Coordinator BirdLife International

Objectives

Explore GFW AIS data as an independent, scientific assessment of seabird bycatch mitigation measure use by:

- To Understand if it is possible to determine night setting by pelagic longline vessels using AIS data
- To develop a convolutional neural network to autonomously assess night setting

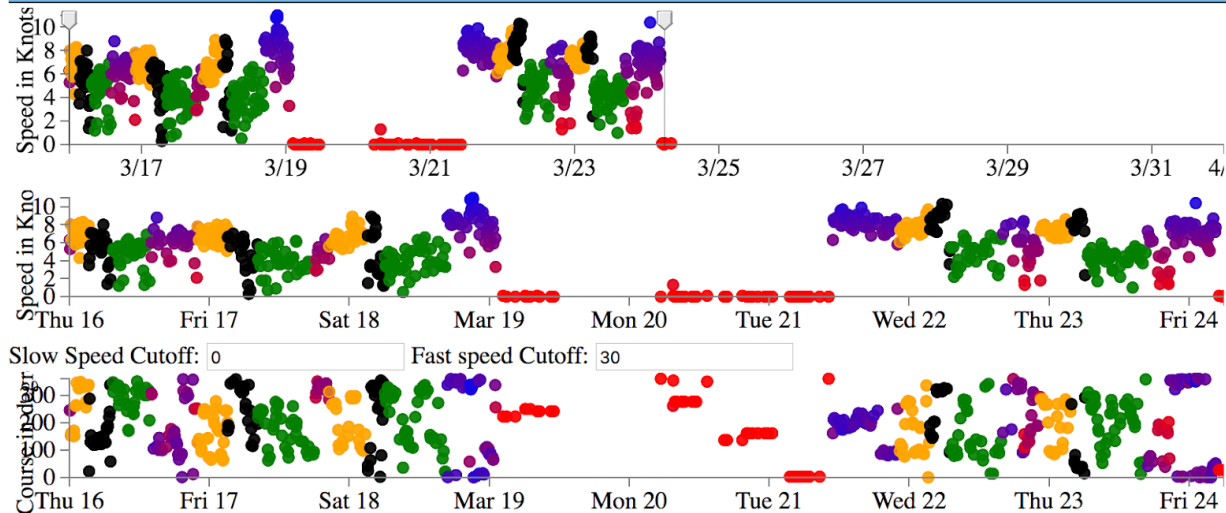
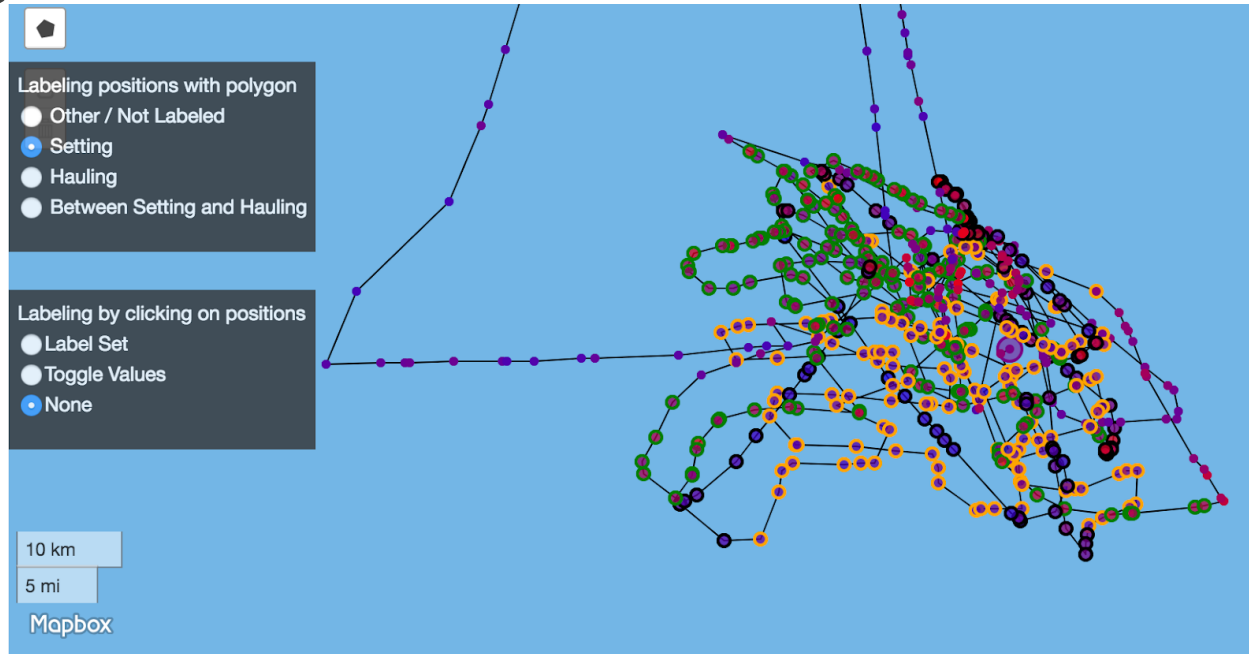




giving nature a home



GLOBAL FISHING WATCH



Partnership for nature and people

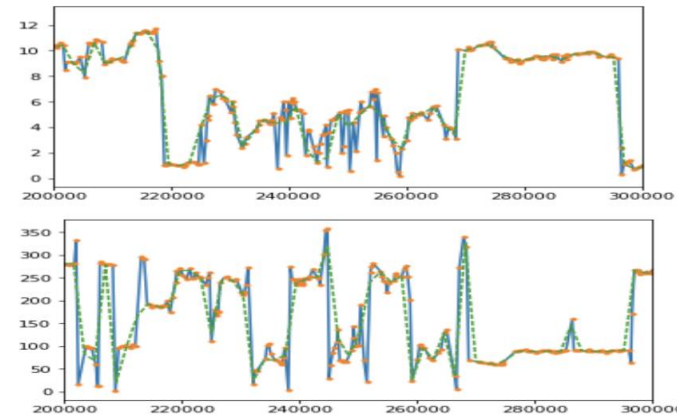
Branch: master | [birdlife / FirstModel.ipynb](#) Find file Copy path

 bitsofbits update notebooks c75321a 11 days ago

1 contributor

1660 lines (1659 sloc) | 223 KB <> Raw Blame History

```
In [2]: from __future__ import division
from __future__ import print_function
import datetime
import dateutil.parser
from glob import glob
import json
import matplotlib.pyplot as plt
import numpy as np
import os
import time
import pandas as pd
import pandas.io.gbq
from sklearn.ensemble import RandomForestClassifier
from sklearn.ensemble import GradientBoostingClassifier
from sklearn.decomposition import PCA
from sklearn.decomposition import KernelPCA
from sklearn.metrics import accuracy_score
from sklearn.metrics import precision_recall_fscore_support
from sklearn.model_selection import KFold
import keras
from keras.models import Sequential, Model as KerasModel
from keras.layers import Dense, Dropout, Flatten, MaxoutDense, LeakyReLU, ELU, Input
from keras.layers import Conv1D, MaxPooling1D, AveragePooling1D
from keras.layers.core import Activation
from keras import backend as k
```



Score

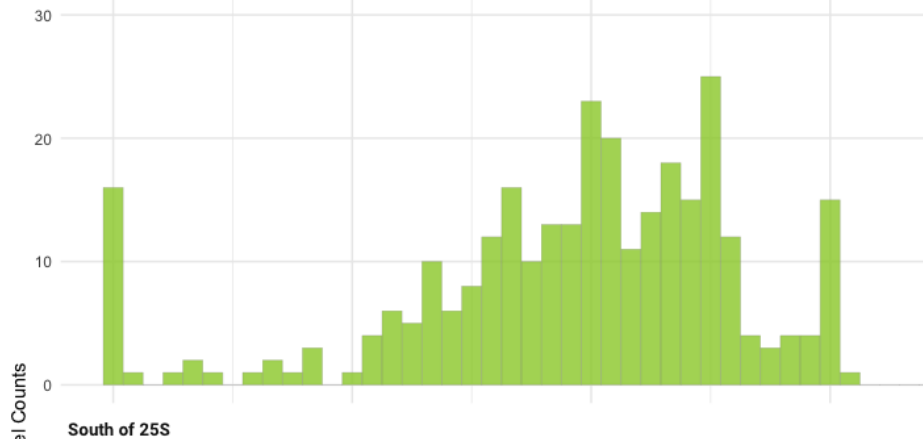
Accuracy	0.94
Recall	0.91
Precision	0.90
F1-score	0.90

- **61,000** sets in total analysed by **300** vessels
- Over **15,000** sets from filtered data by **201** vessels
- **148** vessels from filtered data fished in seabird CMM areas

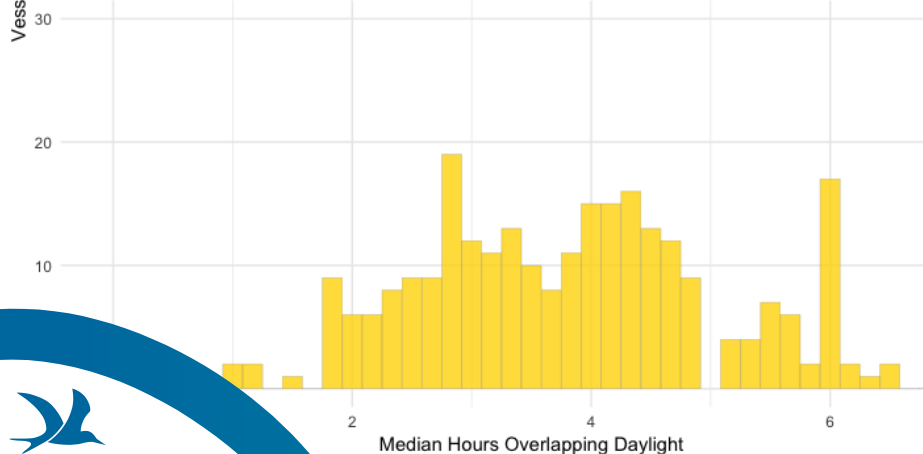
Results

Median Setting Hours Overlapping Daylight

North of 25S



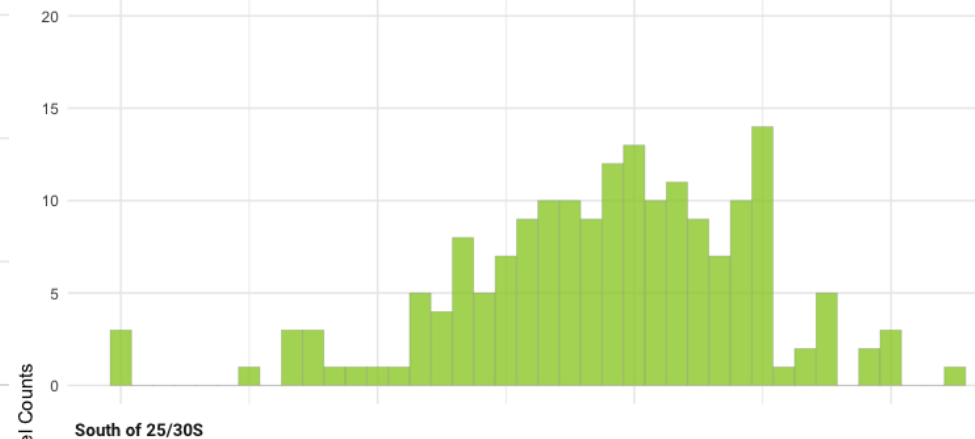
South of 25S



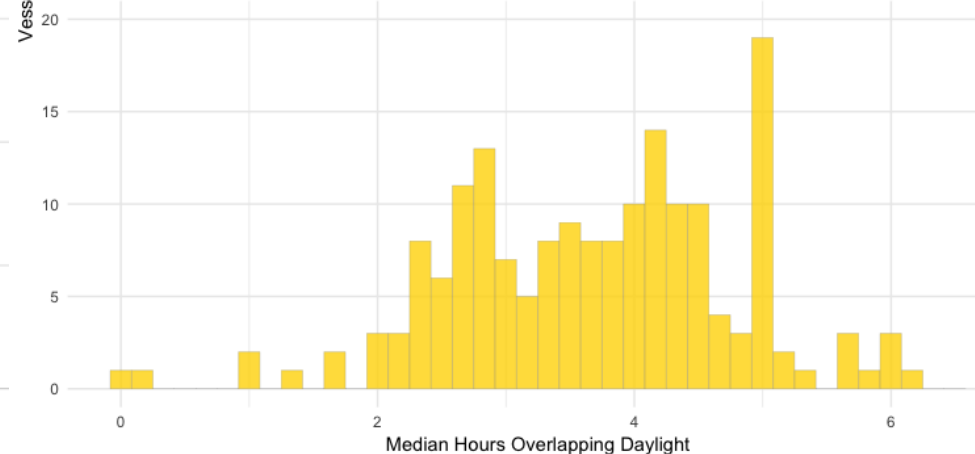
Plotted with 1

Median Setting Hours Overlapping Daylight

North of 25/30S



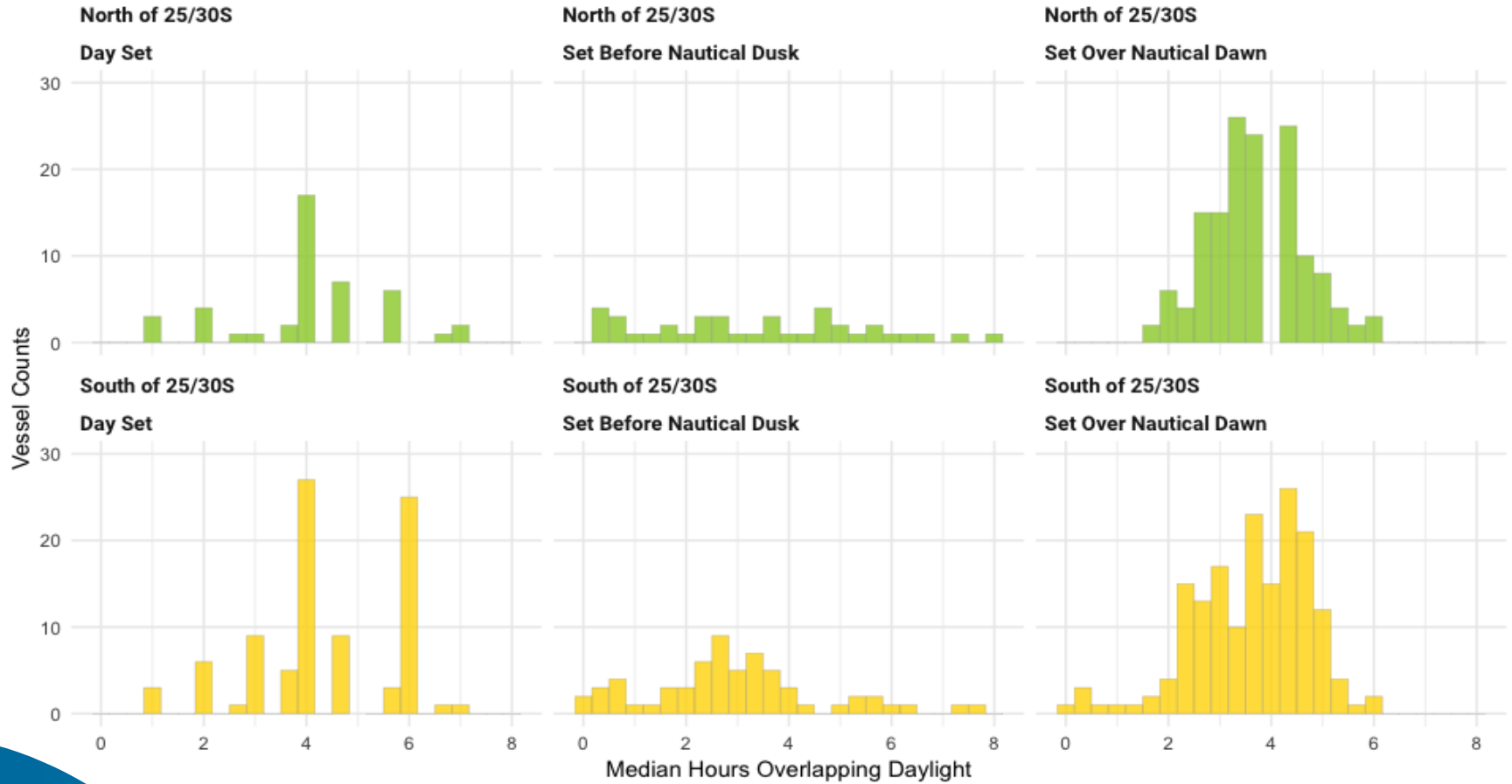
South of 25/30S



(Plotted with 10 min bins and median by ves

Results

Median Setting Hours Overlapping Daylight



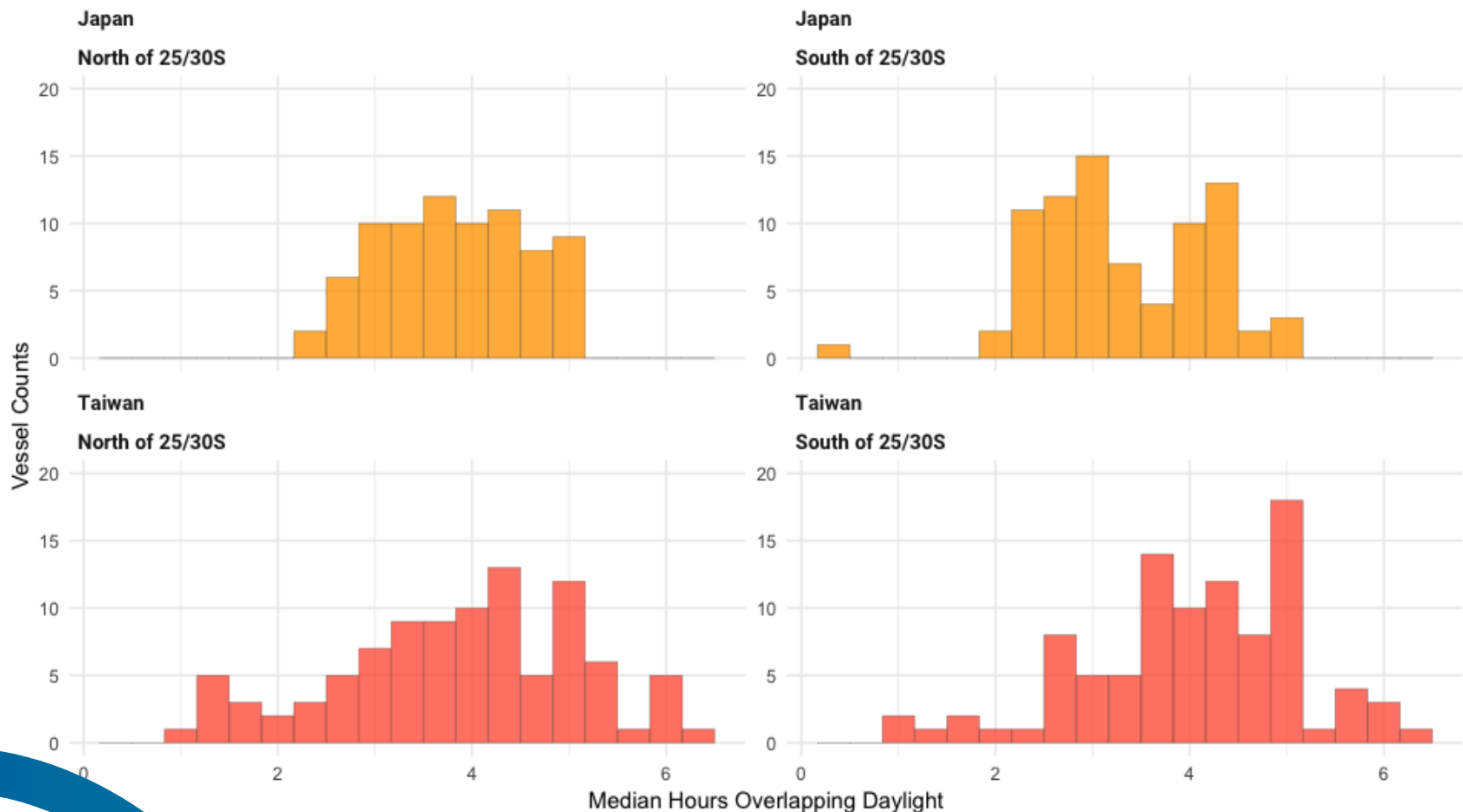
Results

Ocean/RFMO	% compliant night sets	% mostly night sets (<2 hrs overlap with daylight)	% daylight sets (>2 hrs overlap with daylight)	Vessels	Sets
Atlantic	5.2	24.2	75.8	40	1898
Indian	3.5	11.1	88.9	115	11156
WCPFC	1.3	24.8	75.2	37	1995
Total	3.4	13.1	86.89	201	15049

Less than **15%** of night sets could be considered compliant with night setting

Results

Median Setting Hours Overlapping Daylight



Sets on Days with Coverage Gaps >2hr Excluded (plotted with 20 min bins)

Outcomes

It is possible to use AIS data as an independent tool for understanding use/non-use of night setting

Electronic monitoring could potentially be a powerful tool for fisheries management and seabird bycatch monitoring

Levels of night setting use appear to be very low
High concern for Endangered albatrosses