Comisión Interamericana del Atún Tropical
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Preliminary results on automatic set classification

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Prediction of purse-seine set types: preliminary analyses

- Background:
  - Raised by the previous WG-FADs and part of J.2 project.

- Data
  - AIDCP observer data for Class-6 vessels, 2013-2017

- Variables used in the analysis
  - Operational information
  - Environmental information
  - Catch and bycatch information (excluding any information on dolphins)

- Methods
  - Algorithms were built separately for each year.
  - Two different random forest algorithms were developed to predict set type:
    - Mammal/Unassociated/Floating-object
    - Mammal/non-Mammal (= Unassociated + Floating-object)

Prediction of purse-seine set types: preliminary analyses

- Results
  - The preliminary algorithm appears to perform well; better performance may be achieved with more refined models/algorithms.
  - The poorest performance was for Unassociated sets.
  - The misclassification error shown below is the proportion of sets for which the reported set type did not match the predicted set type.

  - Mammal/Unassociated/Floating-object

Misclassification error	2013	2014	2015	2016	2017	Av (sd)
Mammal	0.022	0.023	0.022	0.025	0.020	0.022 (0.001)
Unassociated	0.115	0.109	0.109	0.141	0.116	0.118 (0.01)
Floating-object	0.048	0.047	0.056	0.046	0.047	0.048 (0.004)

  - Mammal/non-Mammal

Misclassification error	2013	2014	2015	2016	2017	Av (sd)
Mammal	0.012	0.010	0.012	0.013	0.015	0.01 (0.001)
Non-Mammal	0.040	0.038	0.043	0.047	0.034	0.04 (0.004)

Prediction of purse-seine set types: preliminary analyses

- Future work
  - Improve unassociated set classification error.

2016	DEL	UNA	OBJ	Error
DEL	10865	266	18	0.025
UNA	465	4213	226	0.140
OBJ	61	405	9764	0.045

  - Add biodiversity/multidimensional indices and additional catch and bycatch size and species composition information.
  - Other algorithms
    - BRT, CT, HMM, etc.
  - Class 1-5 algorithm development.
  - Stay tuned for SAC 2019.

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Questions