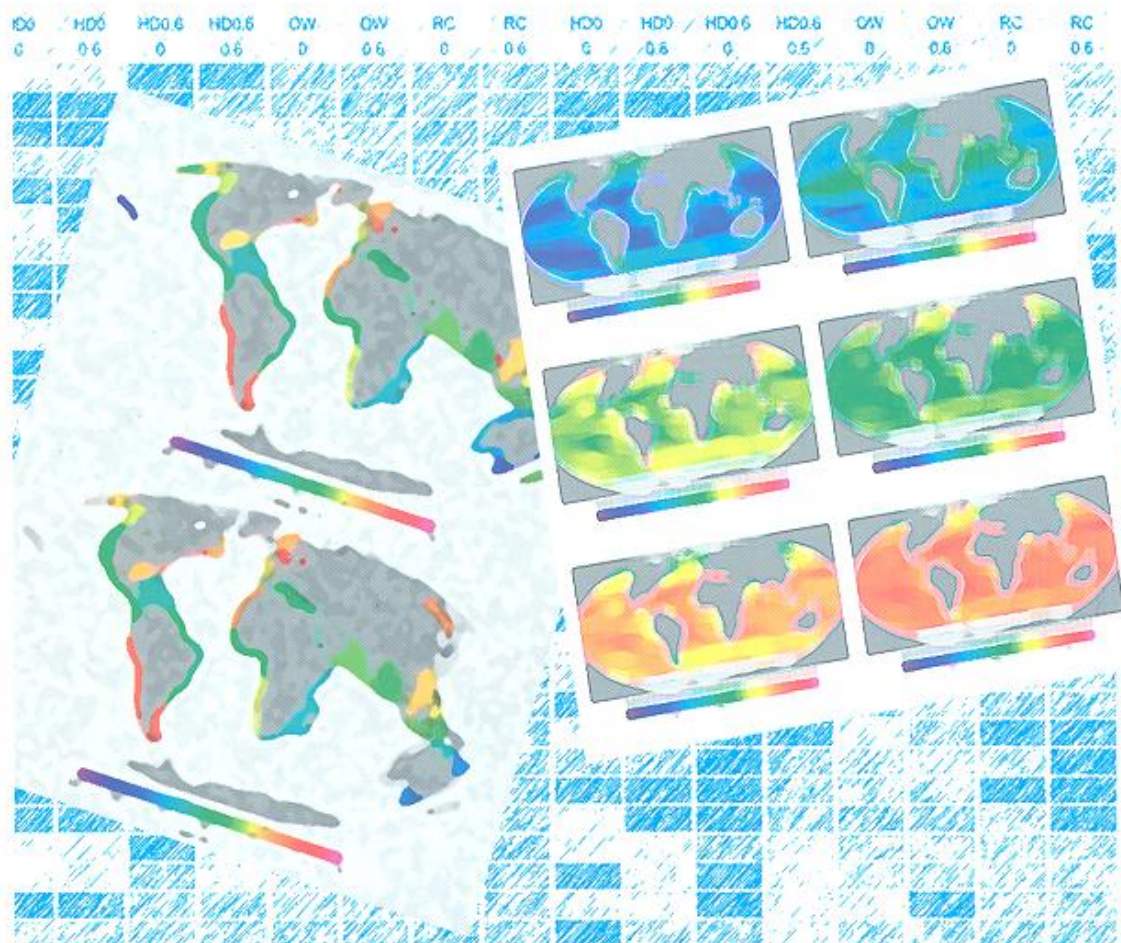


DEVELOPING NEW APPROACHES TO GLOBAL STOCK STATUS ASSESSMENT AND FISHERY PRODUCTION POTENTIAL OF THE SEAS



CONTENTS

Preparation of this document	iii
Abstract	iv
Tables	vii
Figures	vii
Acknowledgements.....	x
Abbreviations and acronyms.....	xi
Overall introduction	1
Part 1 Determining single-stock status	3
1. Introduction.....	5
2. Methods: evaluation of the performance of different models for estimating the status of unassessed fisheries	7
Description of candidate models.....	7
Modified panel regression model (mPRM)	7
Catch-MSY model (CMSY)	9
Catch only model – sampling importance resampling model (COM-SIR).....	11
State–space catch only model (SSCOM).....	13
Simulation framework and implementation.....	14
Data generation framework using the Fisheries Library for R tools.....	14
Deterministic independent variable design	16
Stochastic independent variable design	19
Iterations	20
Estimation platform	21
Data provided to method developers	21
Evaluation of method performance.....	22
Visualizations.....	22
Performance metrics	22
Regression trees	24
Best performance visualization (tile plots)	24
3. Results.....	27
Overall performance.....	27
Best performance	29
Frequency of best performance.....	29
Tile plots	29
Performance maps.....	31
Performance across models.....	34
Determinants of performance for each of the four assessment methods.....	39
Modified panel regression model (mPRM)	39
Catch-MSY (CMSY)	41
Catch-only model (COM-SIR).....	42
State–space catch-only model (SSCOM).....	44
4. Discussion	47
Part 2 Fishery production potential	49
5. Introduction.....	51
Methods and data sources	52
Estimating primary production	56
Transfer efficiencies.....	57
Benthic-mesozooplankton pathway	57
Landings data	58
Assignment of landings data to taxonomic groups	59
Discard data	60

	Mean trophic level and species dominance of landings	60
	Catch–production ratios	61
	Treating uncertainty	61
	Ecosystem-based exploitation reference levels	62
6.	Results	63
	Primary production	63
	Transfer efficiencies	66
	Production potential	67
	Landings and catch	69
	Mean trophic level and dominance of landings	71
	Yield efficiency index	75
	Fishery production potential	76
	Ratio of catch to available production	77
7.	Discussion	79
8.	References	83
	Appendix 1 Additional figures referred in Part I	91
	Appendix 2 Additional figures referred in Part II	105