DEVELOPING FISHERY DEFINITIONS FOR THE SKIPJACK TUNA STOCK ASSESSMENT IN THE EPO

Mark N. Maunder, Haikun Xu, and Cleridy E. Lennert-Cody

1st External Review of IATTC staff's stock assessment of skipjack tuna in the eastern Pacific Ocean
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Outline

- Motivation
  - Areas as fisheries
- Analysis
  - Data
  - Analysis
- Results
- Issues
- Summary

Motivation – Areas as fisheries

- Spatial structure
  - Length-composition varies by area
  - Little information for EPO SKJ to define spatial structure and movement
  - Consider seasonal movement
- Areas as fisheries
  - Approximates spatial structure
  - Use for YFT and BET
  - Haikun's simulations suggest in combination with area weighting of CPUE it can perform well

Motivation – Areas as fisheries

- Tradeoffs
  - More fisheries
    - Better represent age of removals
  - Less fisheries
    - Does not represent sampling variability
    - Makes stock assessment practical
    - Avoids small areas with low sample sizes to construct catch and comp data
- Beneficial to have same areas for all fisheries
- No quantitative criteria to choose the number of fisheries
- Subjective choice to balance tradeoffs

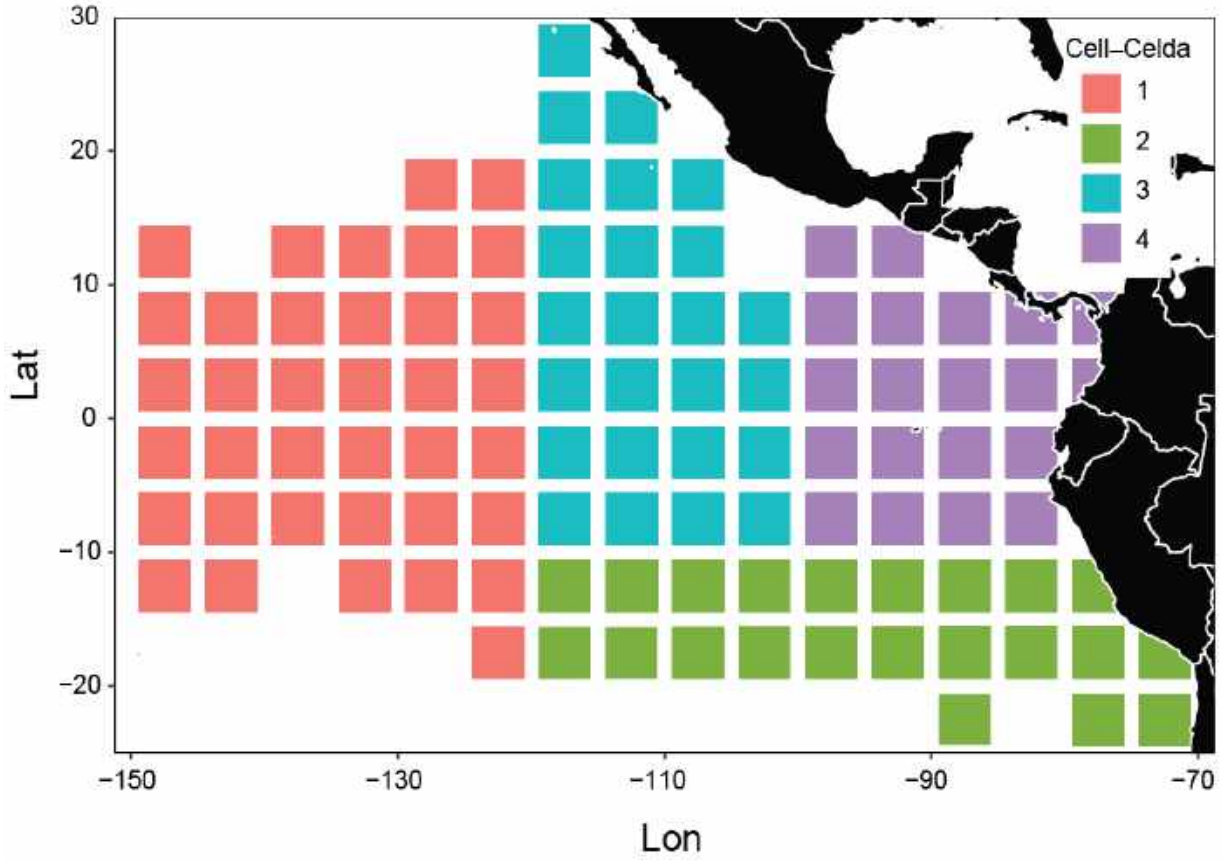
Fishery definitions – SAC-13 INF-I

- Data
  - Length-composition data from Class-6 purse-seine vessel
  - Floating objects (OBJ) and on unassociated schools (NOA)
- Analysis
  - Regression tree methods
  - Latitude, longitude, quarter, cyclic quarter, year
  - Divided by mean composition for year-quarter to reduce recruitment effect
  - Compromise between explaining data and number of fisheries
- Results
  - First split -120 for both set types
  - Other splits differ
  - 3 splits, 4 fishery

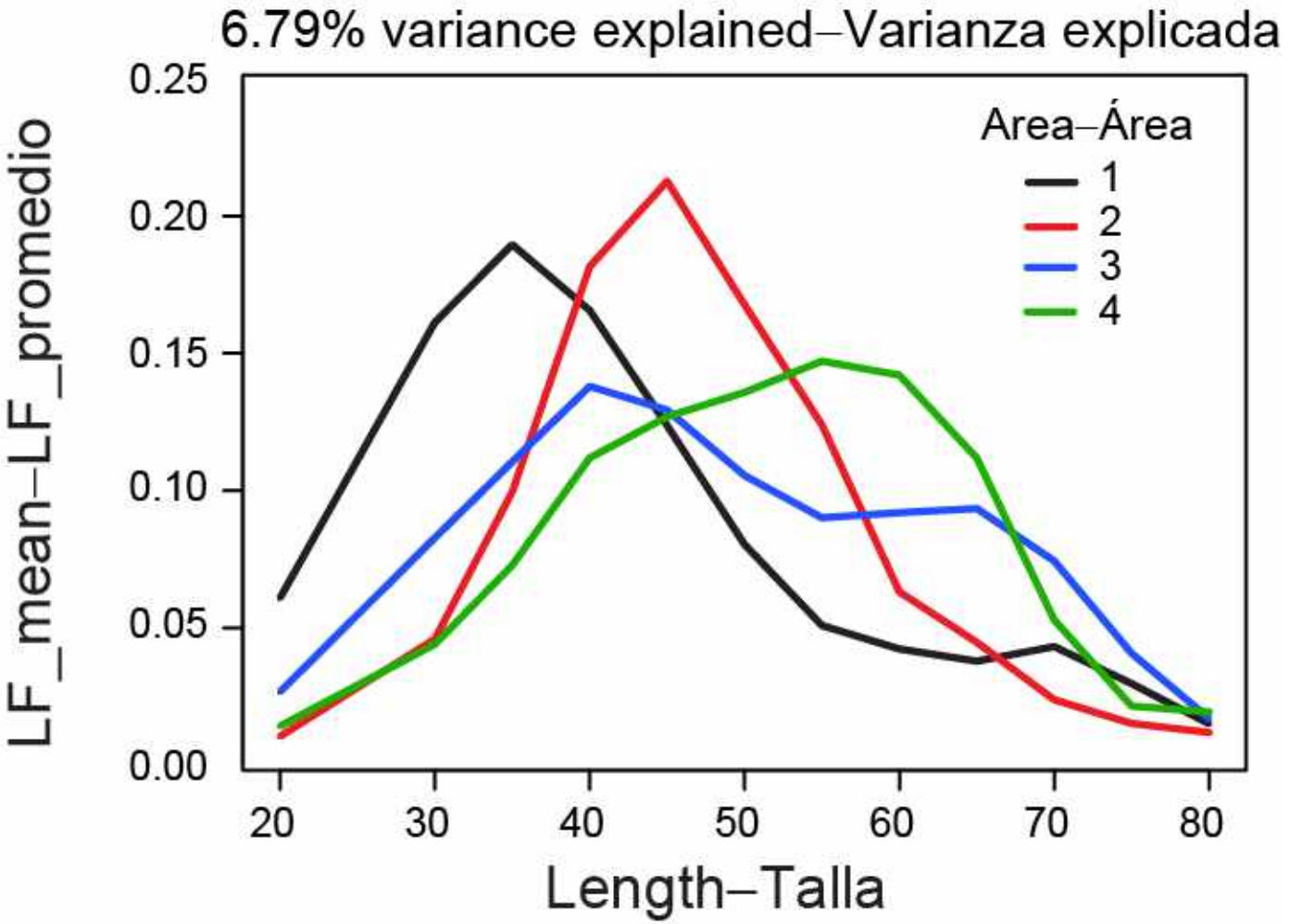
Fishery definitions: OBJ

OBJ.2000.Std.noYear					
	Key	Value	Cell	Var_explained	
Split1	Lon	120°W	NA	5.82%	
Split2	Lat	10°S	2	7.63%	
Split3	Lon	100°W	3	8.84%	
Split4	Lat	5°S	3	9.56%	
Split5	Lon	80°W	2	9.99%	

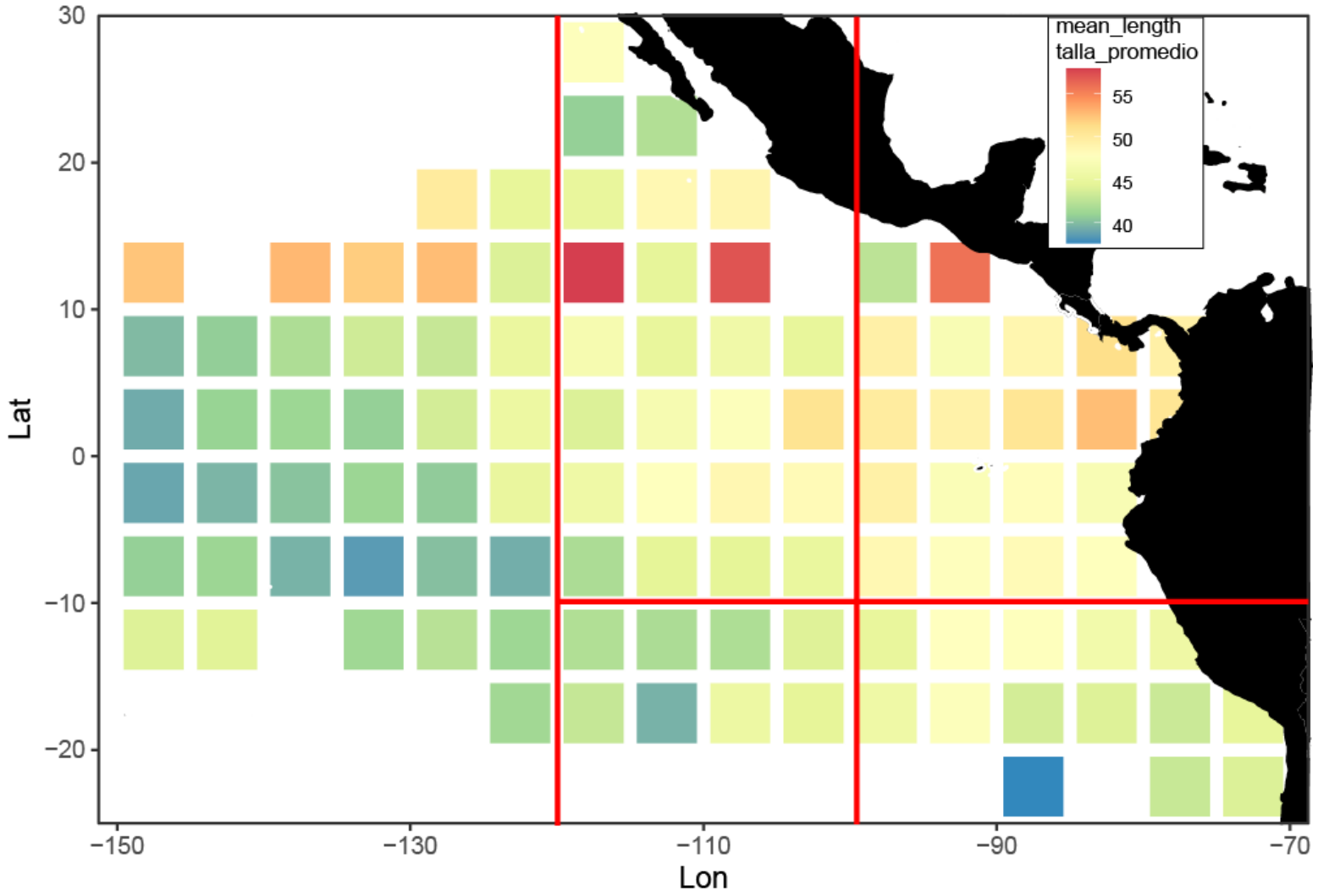
Fishery definitions: OBJ



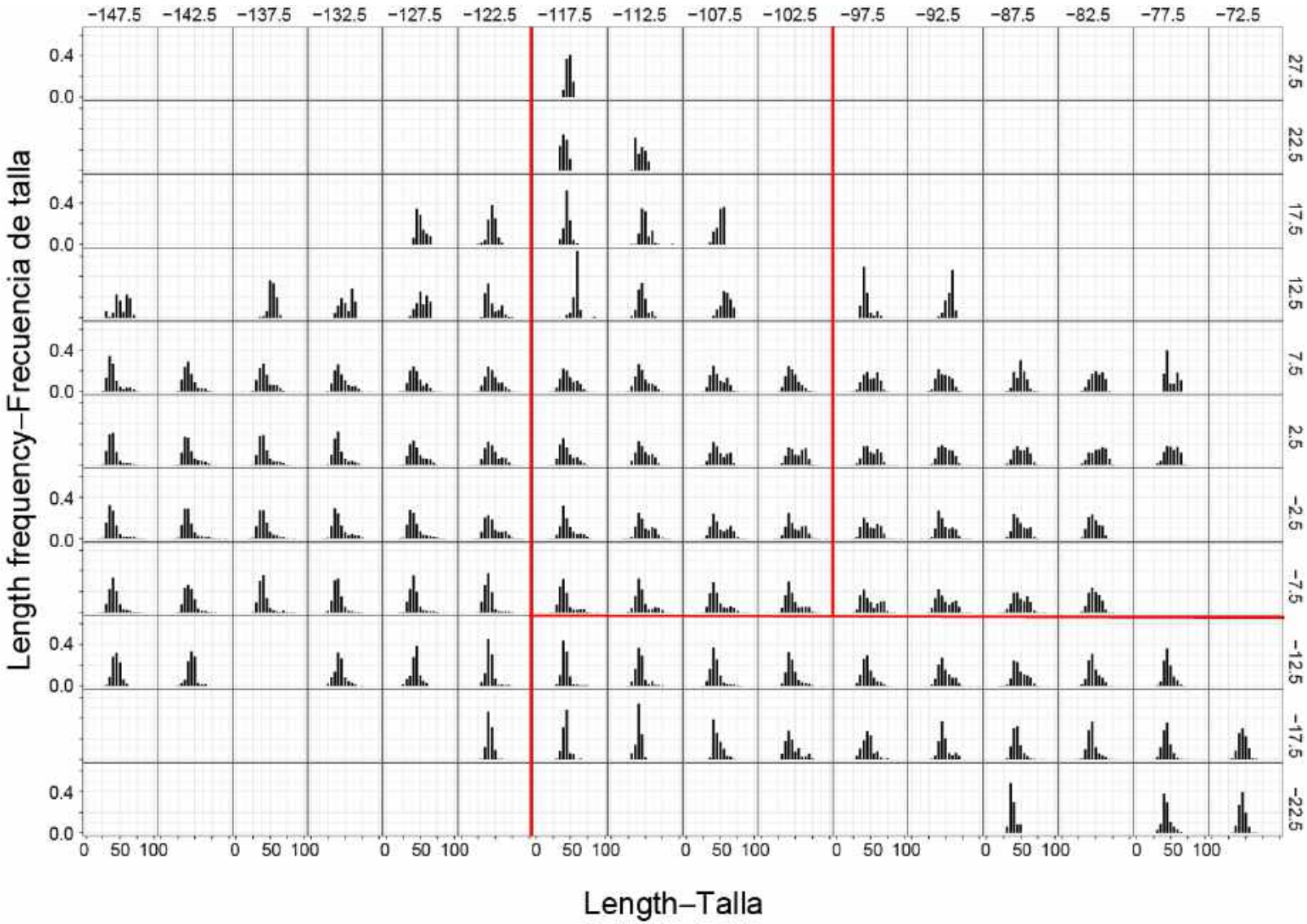
Fishery definitions: OBJ



Fishery definitions: OBJ



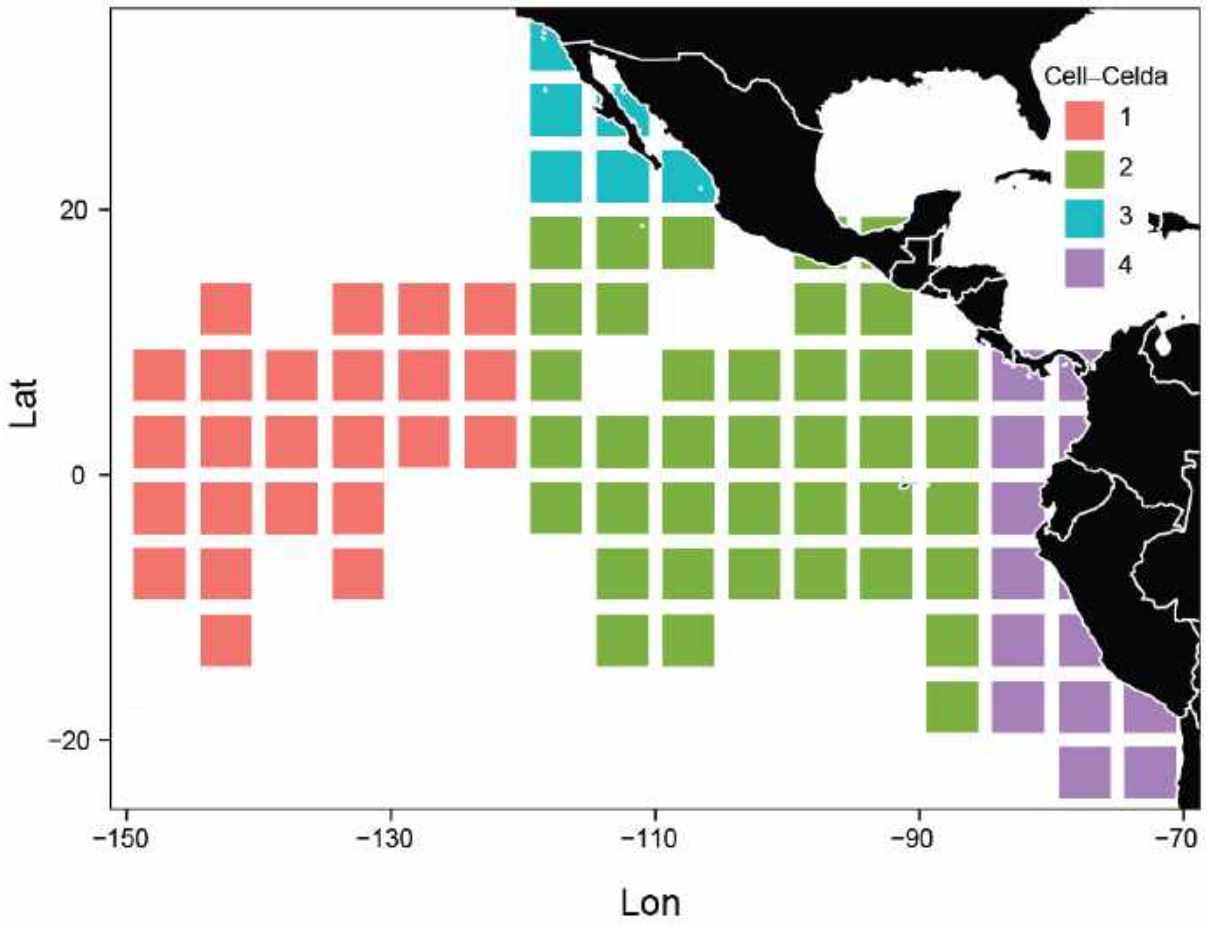
Fishery definitions: OBJ



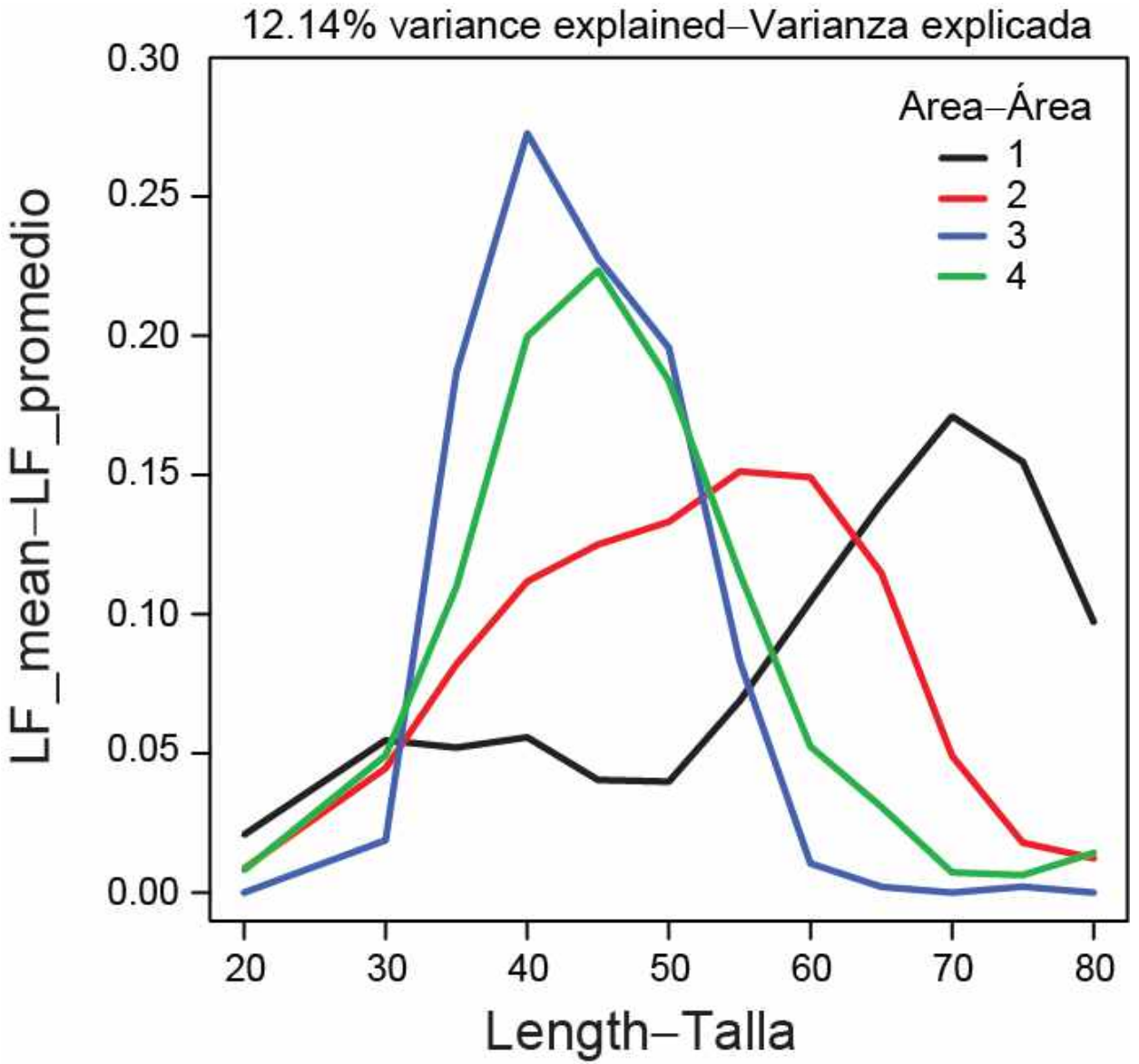
Fishery definitions: NOA

NOA.2000.Std.noYear				
	Key	Value	Cell	Var_explained
Split1	Lon	120°W	NA	6.45%
Split2	Lon	85°W	2	9.63%
Split3	Lat	20°N	2	14.14%
Split4	Lat	0°	4	15.79%
Split5	CQrt	134;2	2	16.36%

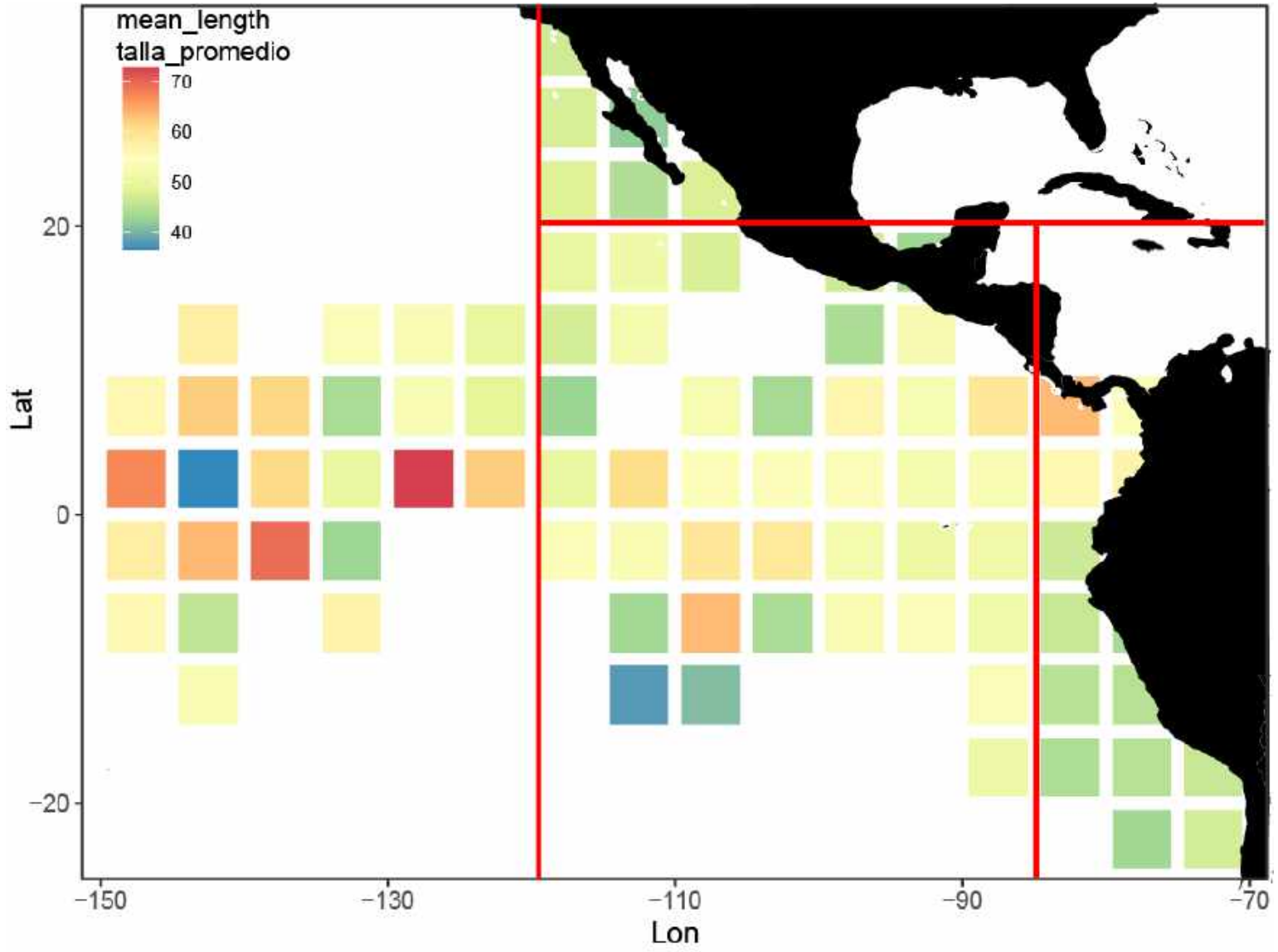
Fishery definitions: NOA



Fishery definitions: NOA



Fishery definitions: NOA



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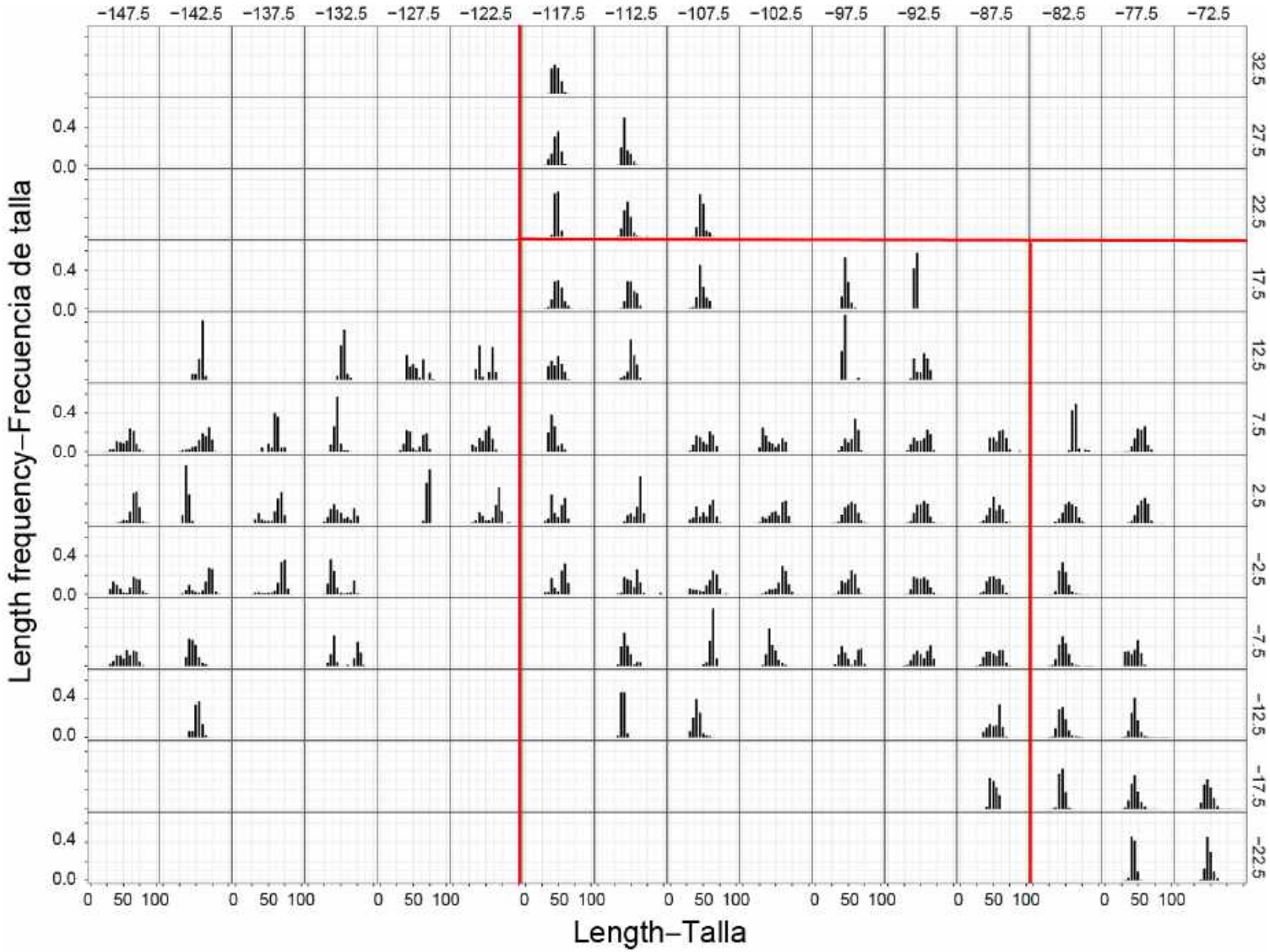
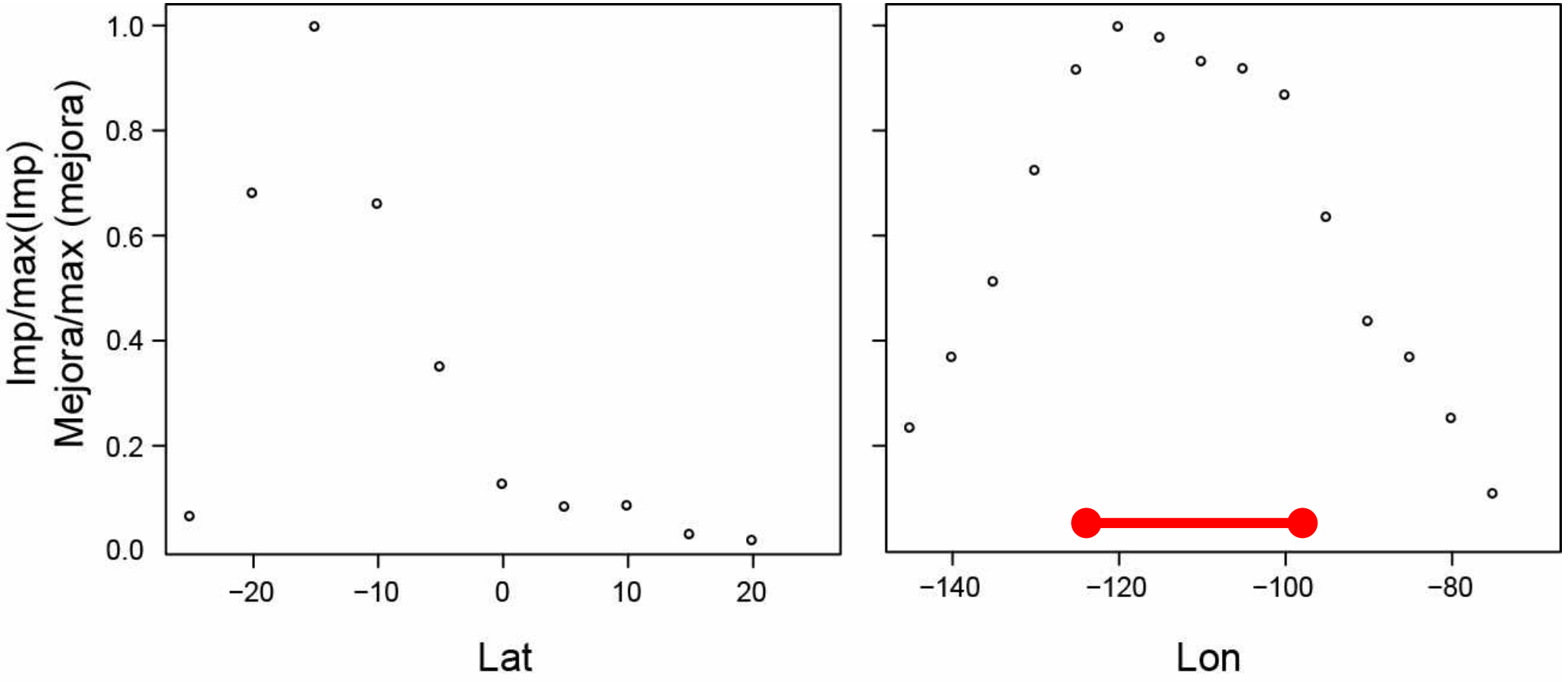


Issues: multiple values supported



Issues: OBJ and NOA 2+ splits differ

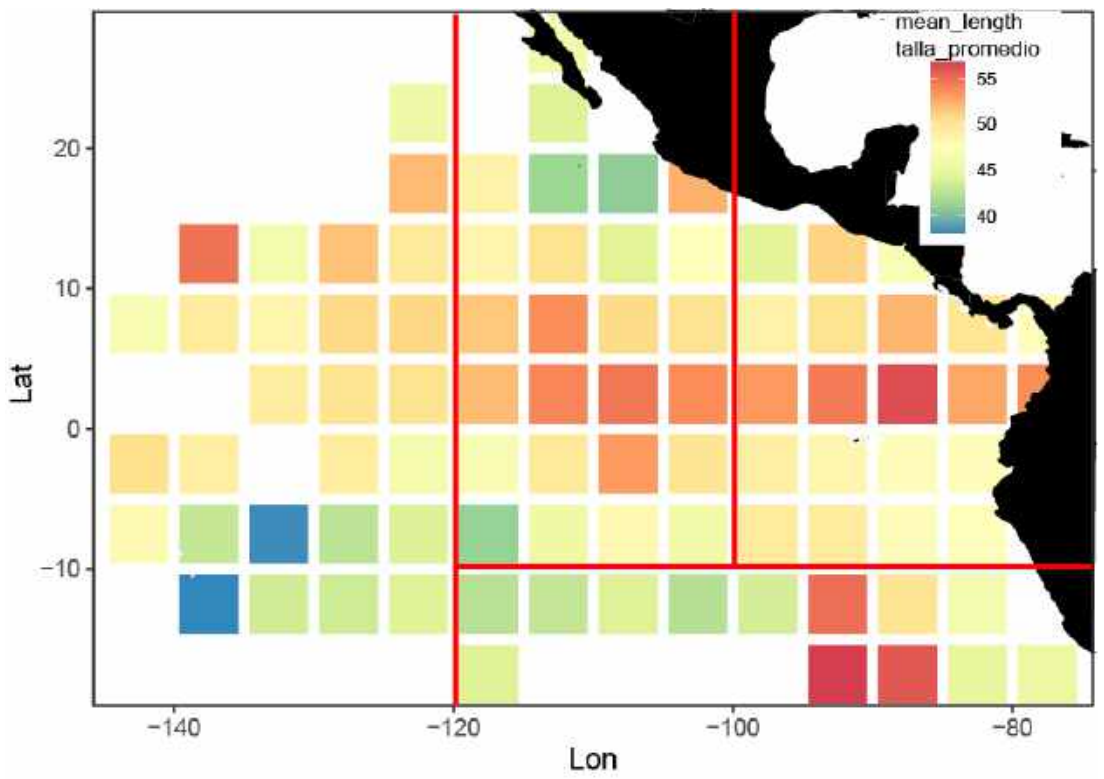
- Using the OBJ splits for the NOA data degraded the percentage of variation explained for that set type

Issues: Data type can create different splits

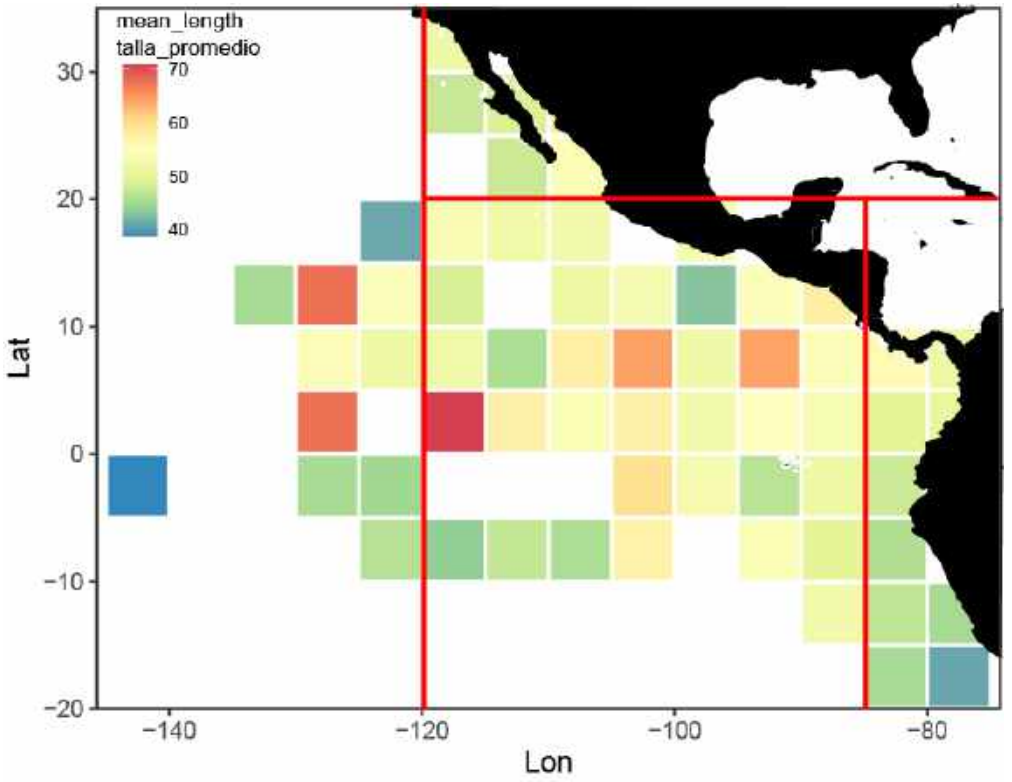
- Data type
  - Well
  - Aggregated 5x5
  - Standardized over year
- Including Year
  - Often selected
  - When using standardized either the same split or later

Issues: 1990-1999 data

OBJ



NOA



Fishery definitions – SAC-13 INF-I

- DEL
  - Low catch levels
  - Two areas: north and south of the equator
- LL
  - Low catch levels
  - One area: whole EPO

Summary

- First split -120 for both set types
- Other splits differ
- 3 splits, 4 fishery
- Issues
  - Similar support for different splits
  - Data type can influence splits
  - 1990-1999 differs

- Research to include more flexible irregular areas
- Area 3 (North coastal) NOA is small

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Questions