

Summary of Georges Bank Atlantic cod in New Jersey MRIP records  
March 2023  
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## Introduction

Georges Bank Atlantic cod (*Gadus morhua*) was most recently assessed in 2021 through the NEFSC's management track process. Based on the updated assessment, stock status could not be quantitatively determined due to a lack of biological reference points associated with an index-smoothing approach, but the peer review panel recommended the stock remain considered as overfished due to poor stock condition (Figure 1, below); overfishing status is unknown (NEFSC 2022). A research track peer review is scheduled for summer 2023.

The NEFMC recently recommended to GARFO recreational measures for Georges Bank cod for fishing year 2023 with the intention they would be implemented May 1<sup>st</sup> 2023 (J Cournane, NEFMC, pers. comm.). The NEFMC recommended an open season from May 1-31 and September 1 – April 30 (closed season June 1 – August 31), a 23-inch minimum size, and possession limit of 5 fish per day. This short summary outlines results of querying MRIP data to assist the New Jersey Marine Fisheries Council's decision making with respect to the NEFMC recommendations to GARFO.

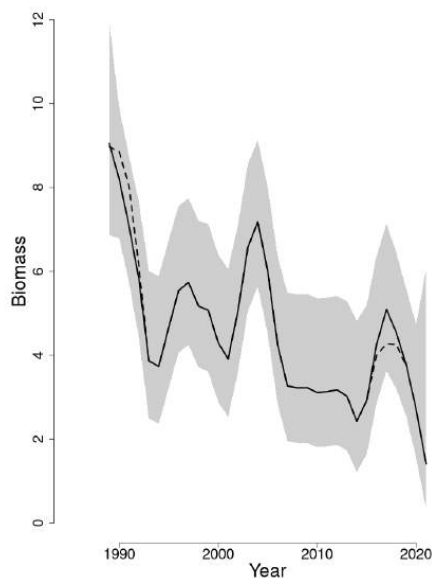


Figure 1. Trends in smoothed survey biomass (kg/tow) of Georges Bank Atlantic cod between 1989 and 2021 from the 2021 (solid line) and 2019 (dashed line) management track assessments. The approximate 90% log-normal confidence intervals are shown. The 2020 value is based only on the 2019 fall survey while the 2021 value is based only on spring 2021. (From NEFSC 2022)

## Methods

MRIP data were queried through the NOAA web interface, and raw data files were also downloaded for very fine-scale queries of the data. For regional analyses, a subset of MRIP intercept stations in Massachusetts were included so that only Georges Bank cod would be queried (S Steinback, NOAA, pers. comm.). Length frequency analyses are based on an MRIP web interface query; Atlantic cod records were not available in NJ's volunteer angler survey database.

## Results

On average, in recent years (2018-2021), most harvest (by weight) and catch (by number) of Atlantic cod in NJ occurs in MRIP wave 3 (May and June) (slide 1). Most harvest (by weight) and catch (by number) is caught by the private sector (slide 2). Reported harvest and catch of is very variable in NJ (slide 3). An NJDEP analysis suggested that in the most recent four years available, most harvest and catch occurs in federal waters (slide 4), though an alternative set of years suggests the opposite (slide 6 b). On average, most fish caught in NJ are kept (slide 5).

At a more regional level, slides 6a and 7 suggest NJ is responsible for a non-trivial fraction of annual total harvest, catch, and removals.

An examination of length frequency data suggests that instituting a minimum size in NJ state waters may result in a maximum of a 64% reduction in removals (slide 8); this is premised on all queried length frequency data representing harvest, which is unlikely. Interestingly, an examination of catch by proposed closed (June, July, August) and open (all other months) seasons indicates that between 2018-2021, 100% of harvest took place within the proposed open season, and 100% of releases occurred in the proposed closed season. Additionally, during those four years, there are no records in which harvest exceeded 2 fish (slide 9 b).

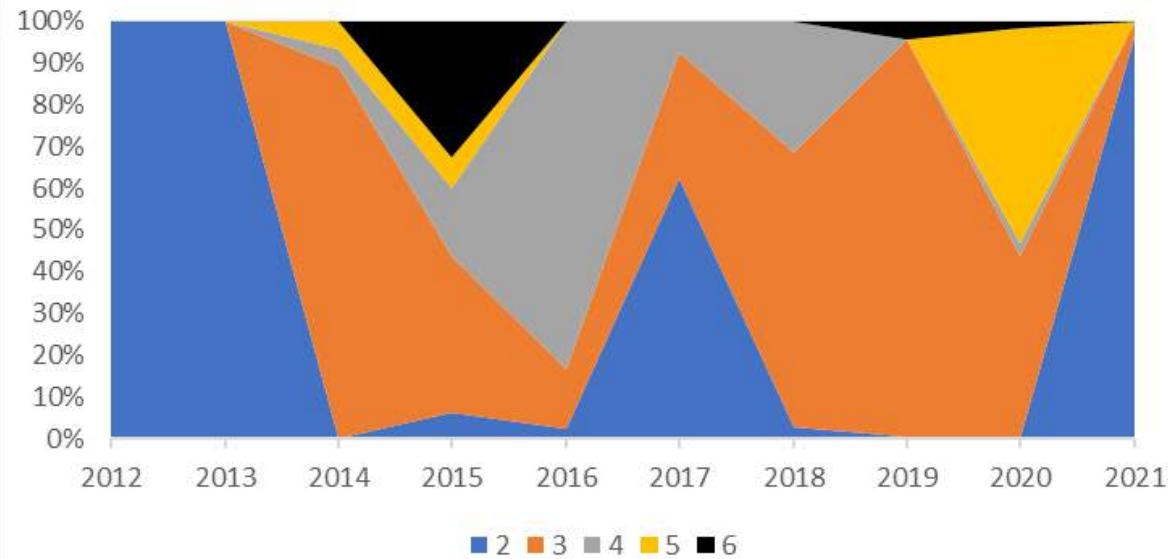
Slides 10 indicates that relative to commonly caught species in NJ, very few trips in which Atlantic cod are caught are intercepted by MRIP. Lastly, the MRIP experimental design weights samples to adjust for, for example, the fraction of anglers actually intercepted (vs those observed), and the distribution of expansions is plotted in slide 11.

## Literature cited

[NEFSC] Northeast Fisheries Science Center. 2022. Management Track Assessments Fall 2021. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 22-07; 53 p.

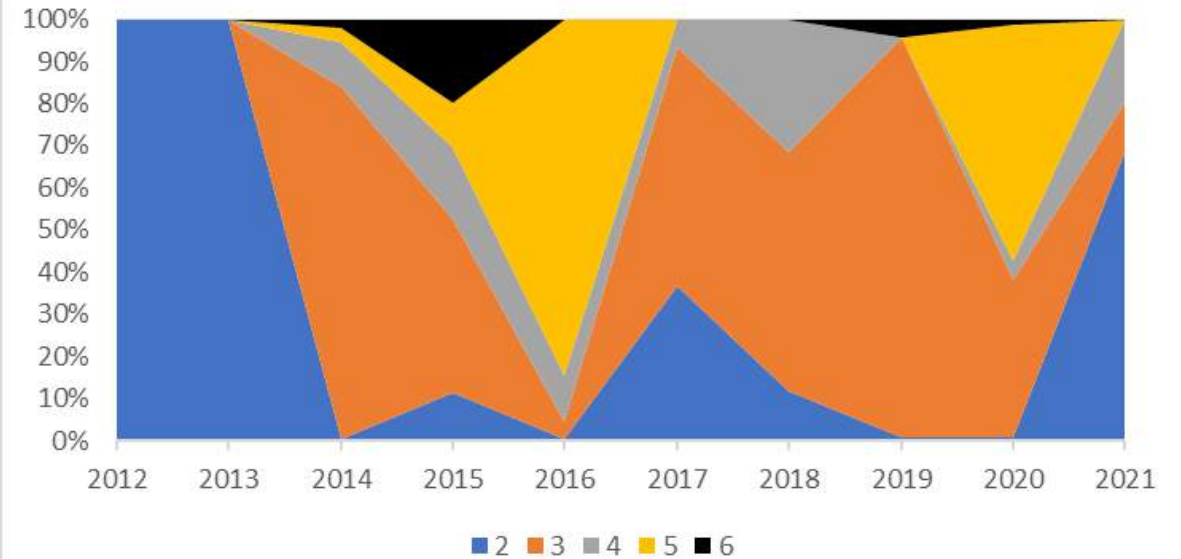
# NJ harvest (AB1 wt) and catch (AB1+B2 n) by wave

NJ harvest (wt) by wave



Wave	Months	4-yr mean	10-yr mean
2	Mar-Apr	25%	37%
3	May-Jun	52%	38%
4	Jul-Aug	9%	15%
5	Sept-Oct	13%	7%
6	Nov-Dec	2%	4%

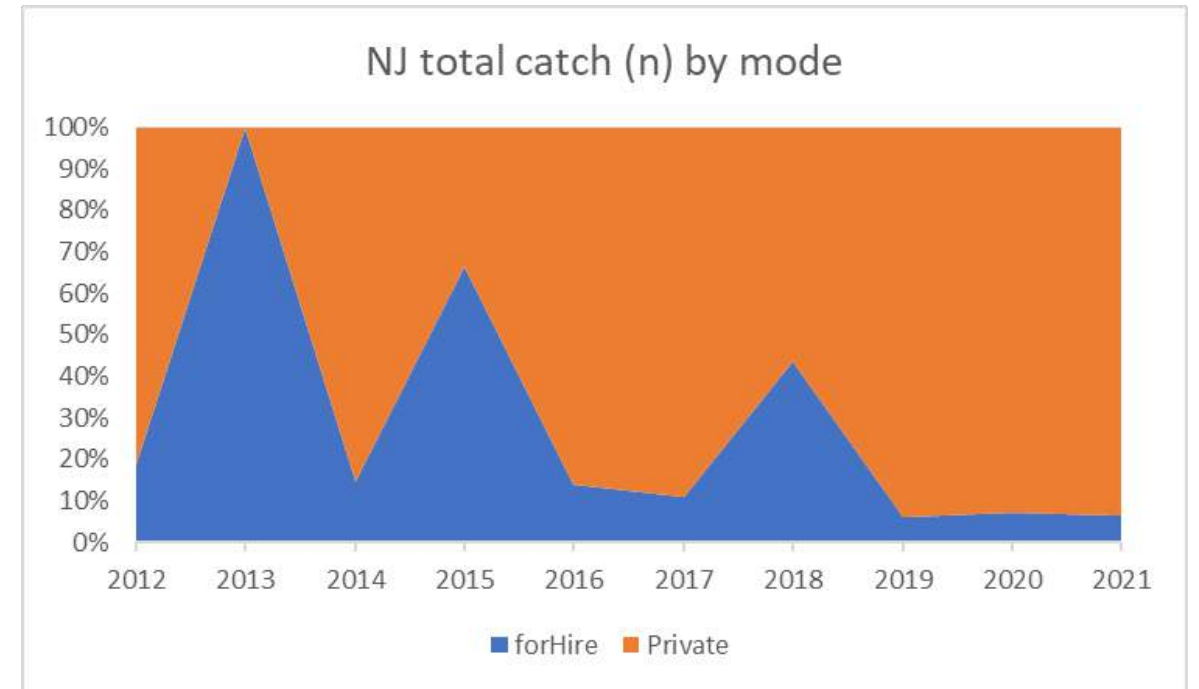
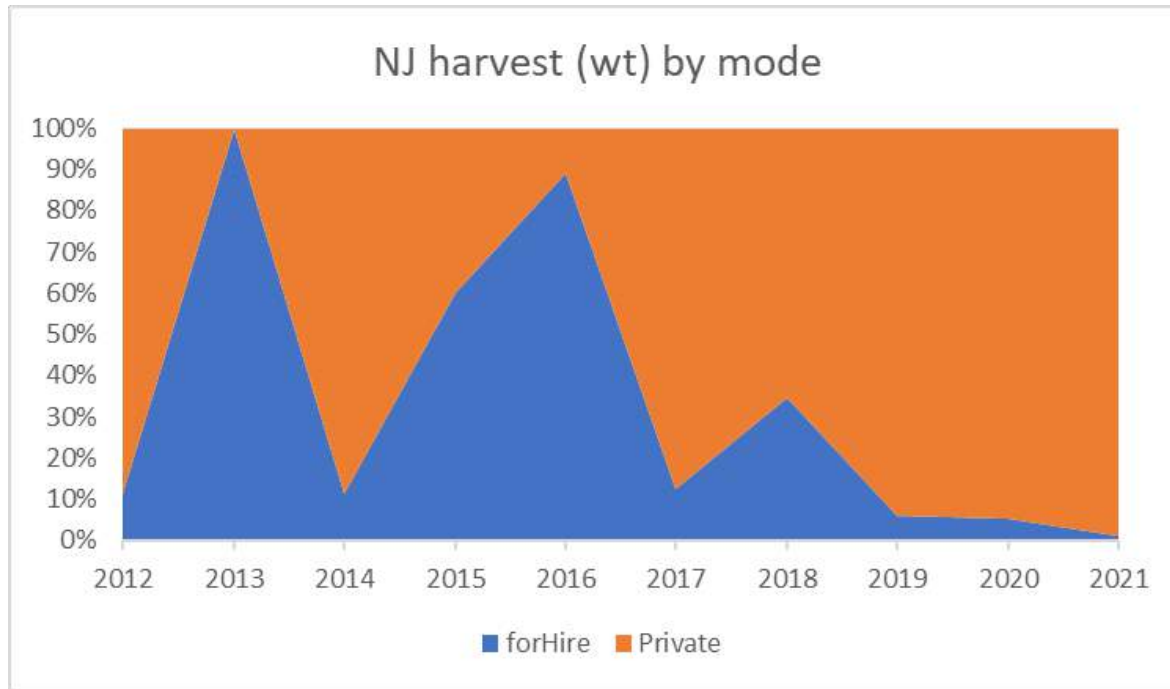
NJ total catch (n) by wave



Wave	Months	4-yr mean	10-yr mean
2	Mar-Apr	21%	33%
3	May-Jun	50%	39%
4	Jul-Aug	14%	10%
5	Sept-Oct	14%	15%
6	Nov-Dec	1%	3%

2021, Wave 2, 14 total intercepted trips; 1 trip harvested 2 fish x wp\_int = 9,578

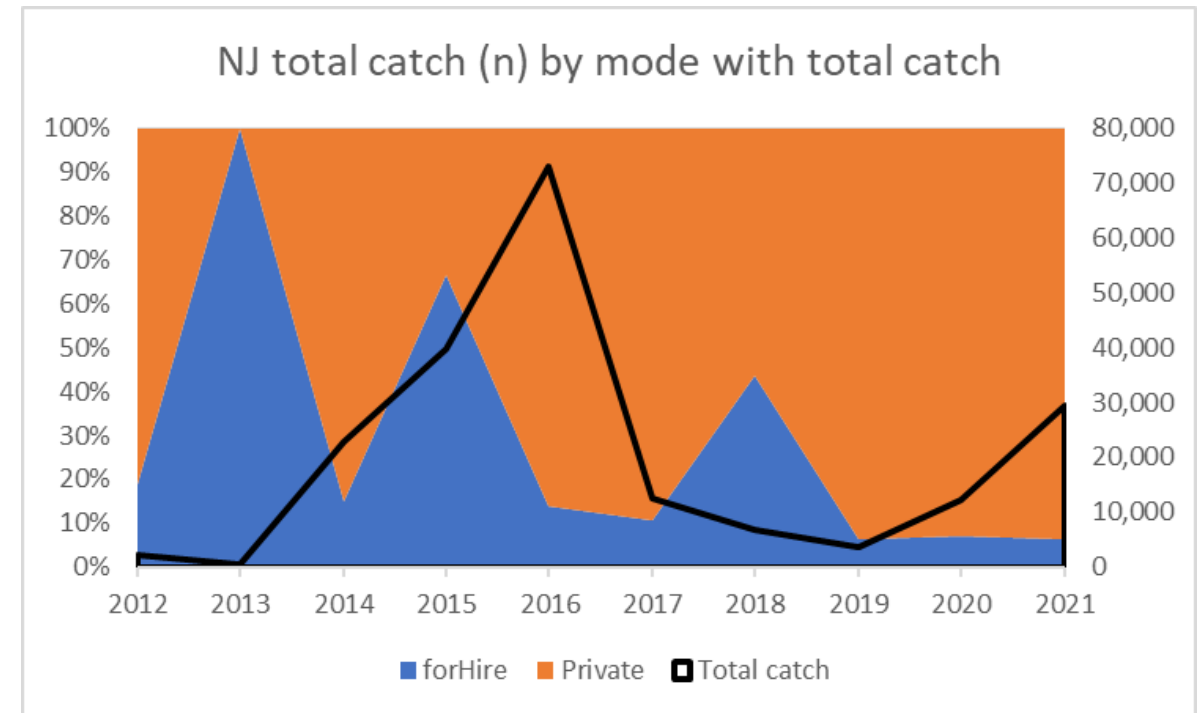
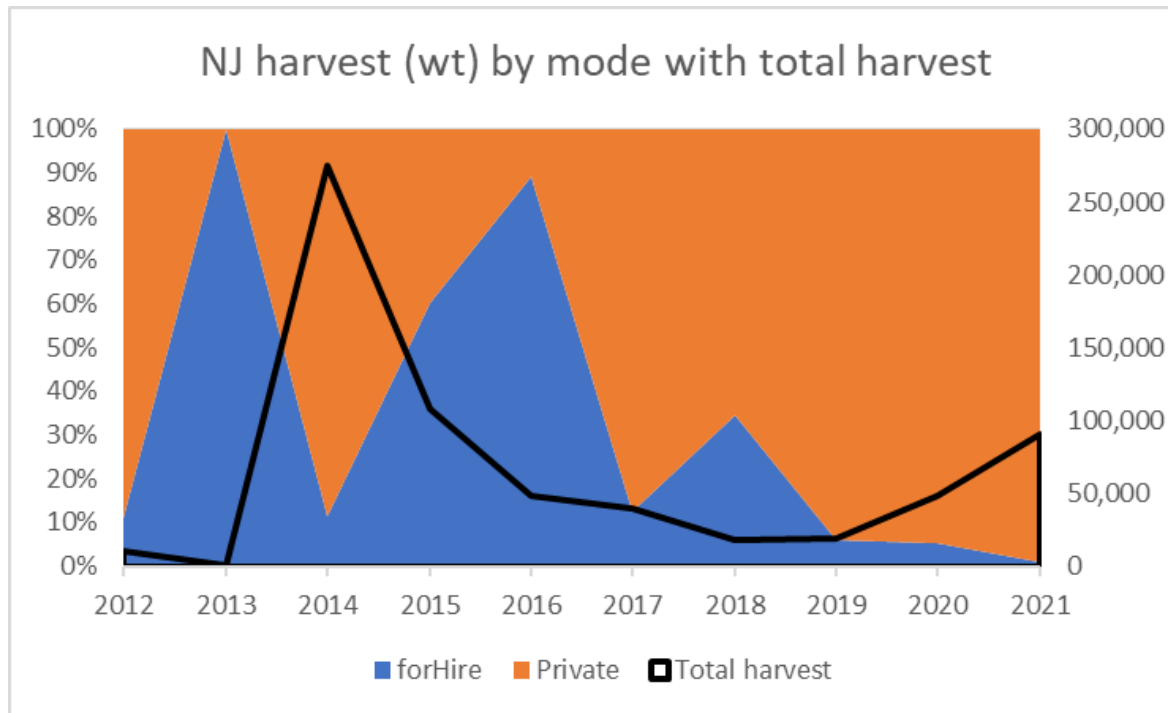
# NJ harvest (wt) and total catch (n) by mode



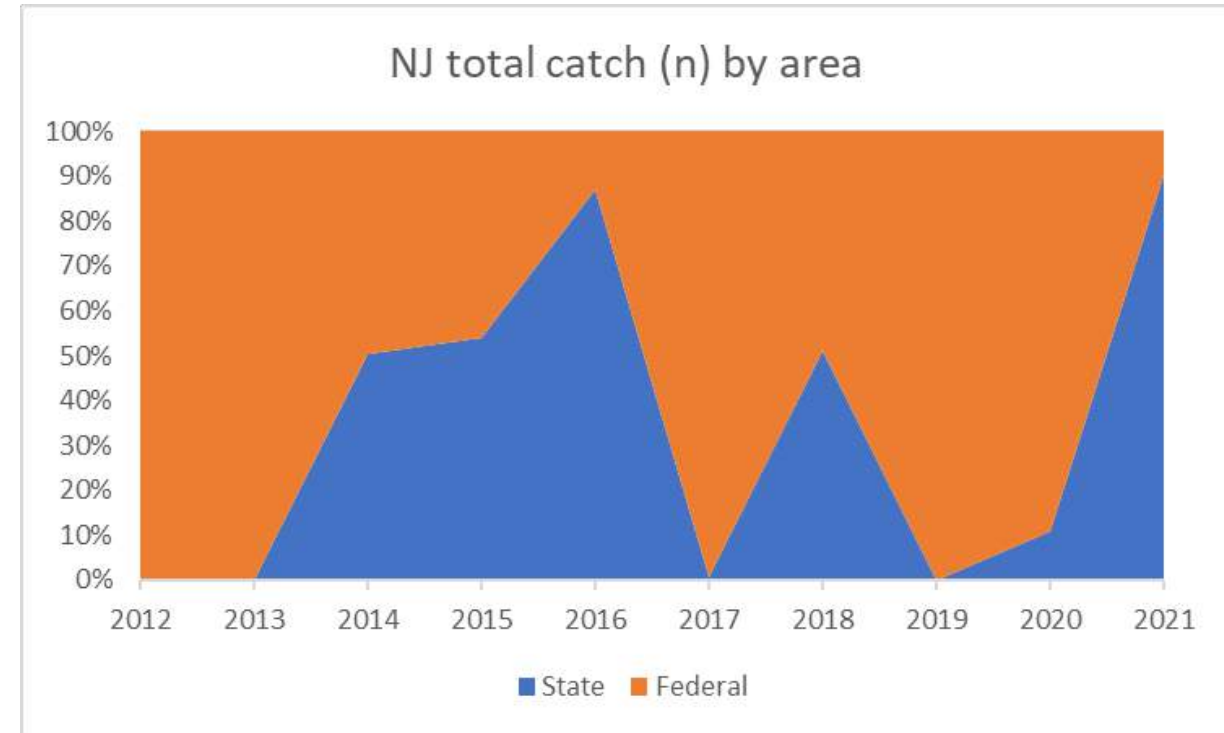
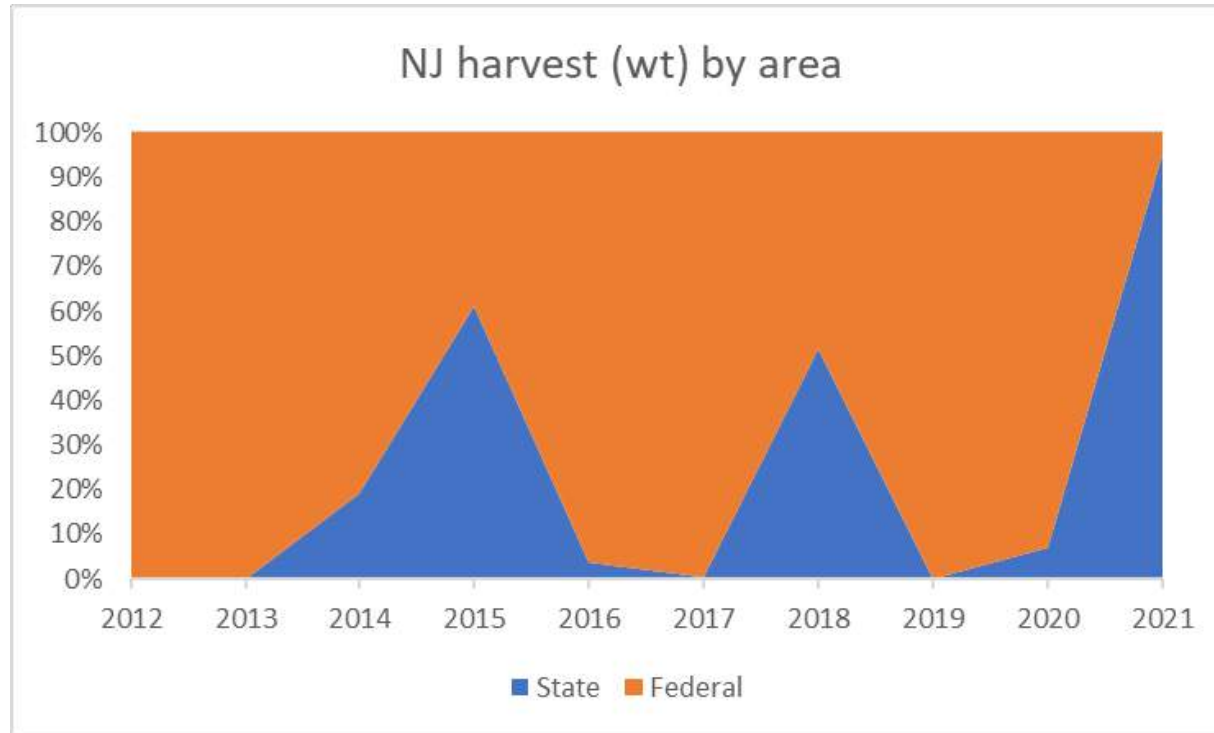
Mode	4-yr mean	10-yr mean
For-hire	12%	33%
Private	88%	67%

Mode	4-yr mean	10-yr mean
For-hire	16%	29%
Private	84%	71%

# NJ harvest (wt) and total catch (n) by mode

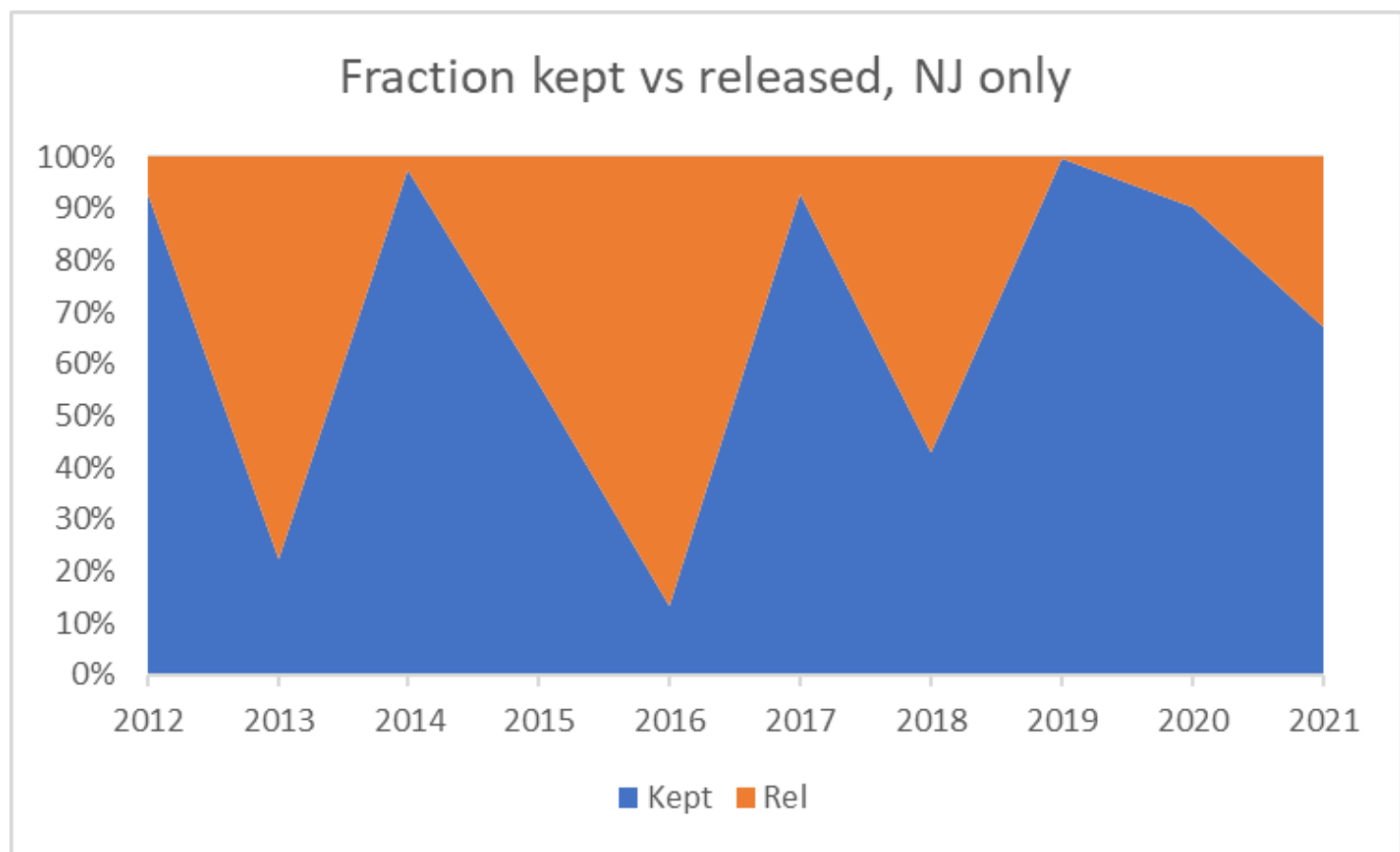


# NJ harvest (wt) and total catch (n) by area



Area	4-yr mean	10-yr mean
State	39%	24%
Federal	61%	76%

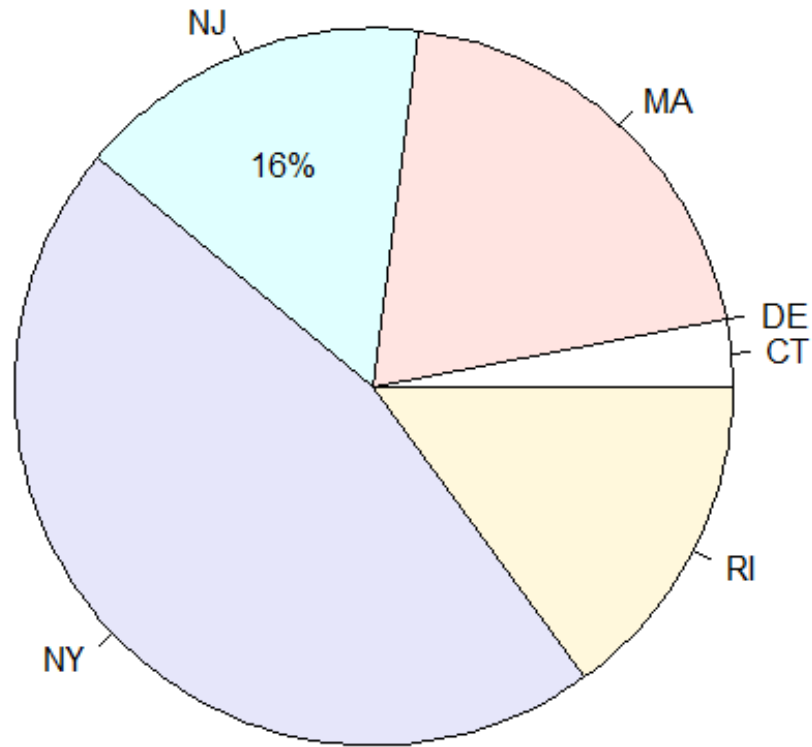
Area	4-yr mean	10-yr mean
State	38%	34%
Federal	62%	66%



Disposition	4-yr mean	10-yr mean
Kept	75%	67%
Released	25%	33%

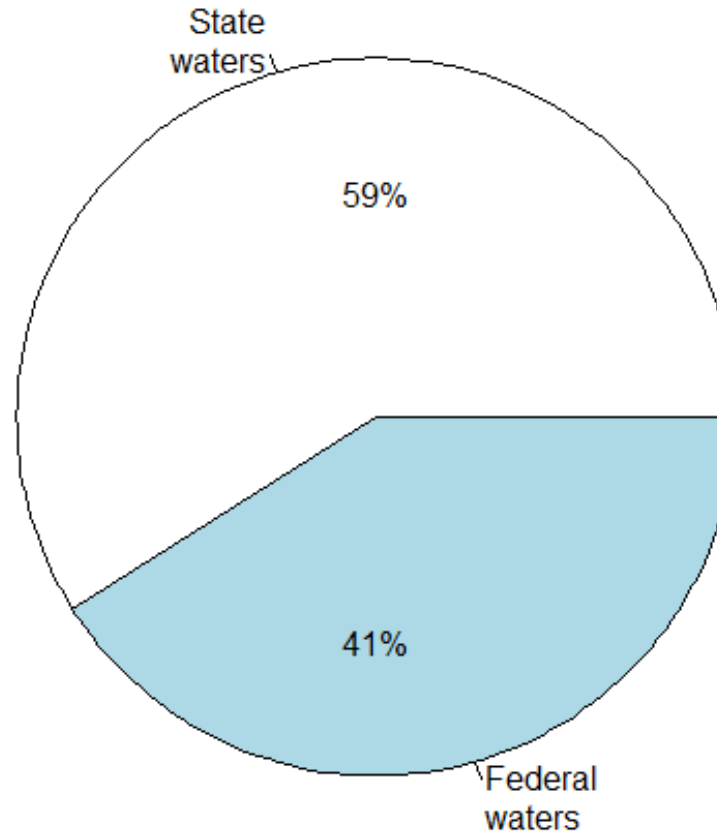
a)

**Proportions of GB rec cod total mortality  
(landings + dead rel) by state (FY20-FY22)**



b)

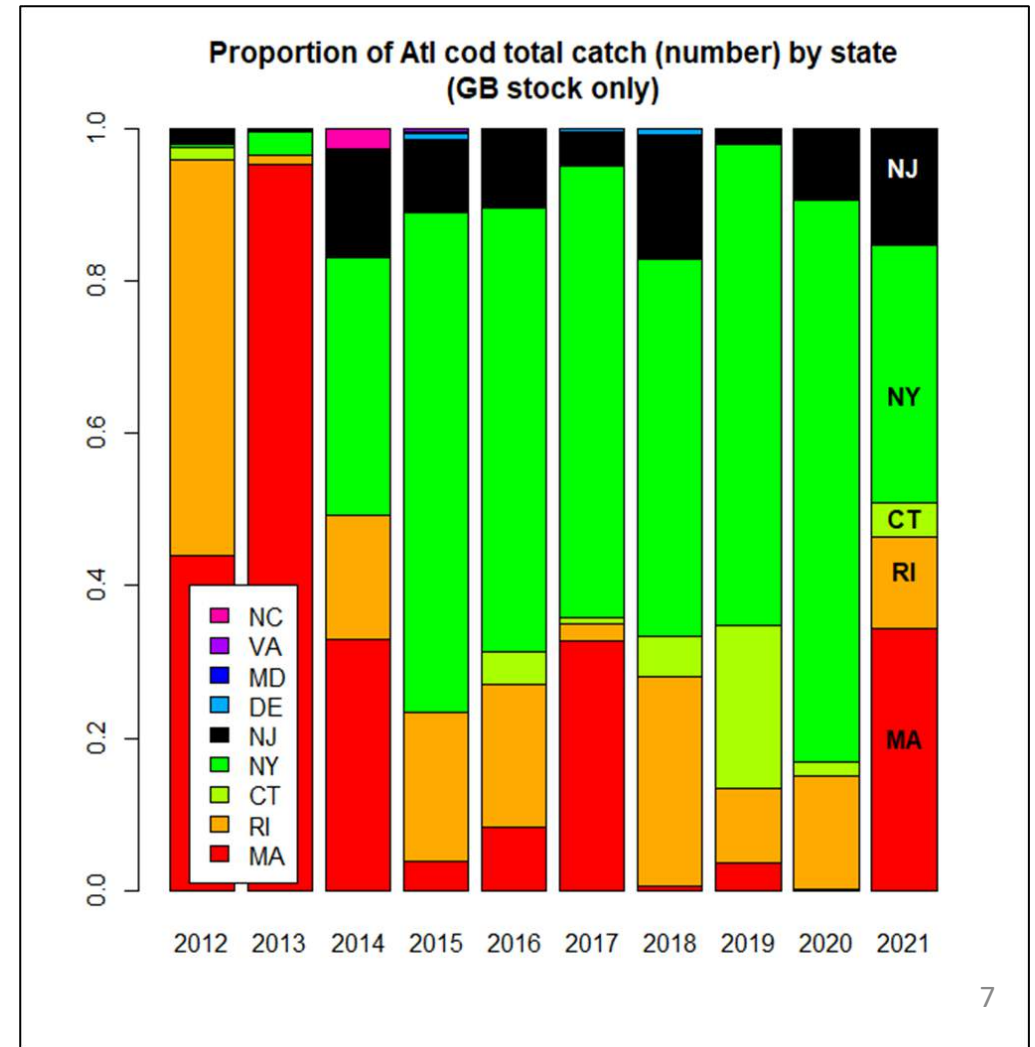
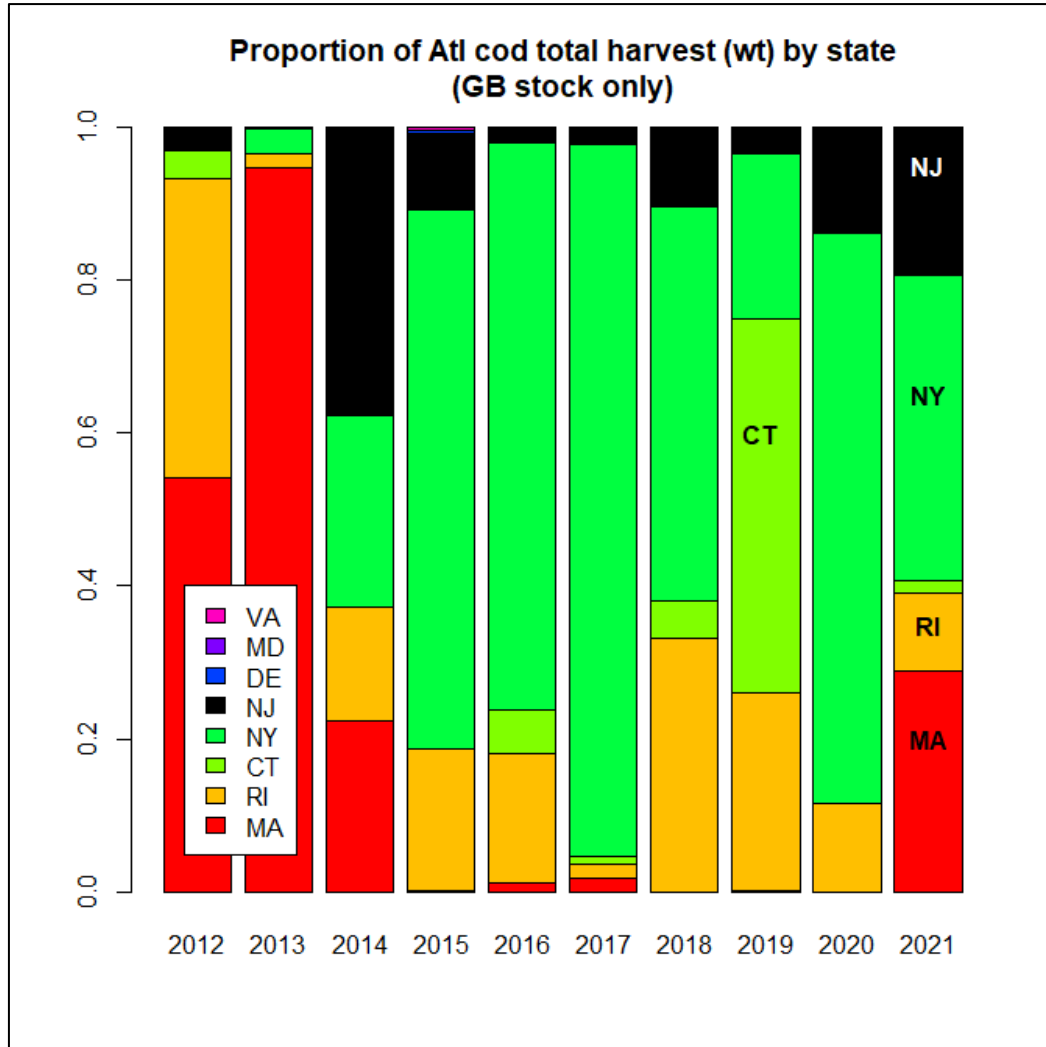
**NJ Atl cod total mortality  
3-year avg (2020-22)**



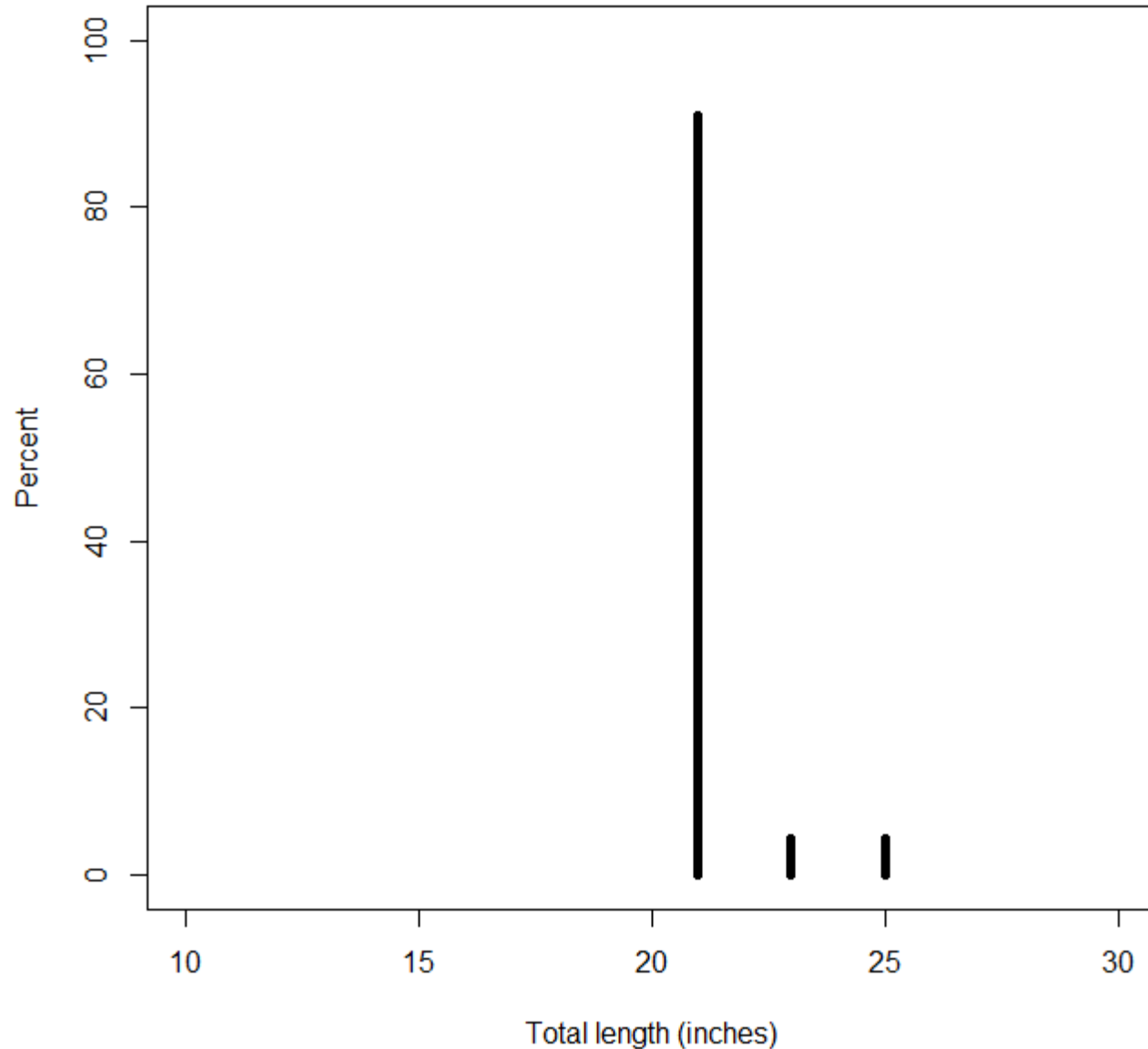
Therefore, for every 100 pounds of cod removed from the cod population, ~9.5 pounds came from NJ state waters.



# Fraction of harvest and catch by state (Georges Bank stock only)



## Atl cod caught in NJ (2018-2021, all waves, STATE WATERS ONLY)



\*Assume\* all kept

	total	AB1	B2*0.3	total removals
<23	19,156	0	5,747	5,747
[23+	1,897	1,897		1,897

Removals		
current	proposed	change
21,053	7,644	-64%

From 2018-2021 all harvest took place during proposed open season & fish were only released during the proposed season closure. During this time there are also no records of harvest > 2 fish.

# Catch (AB1 + B2) and harvest (AB1) from intercepted trips

a)

Fish per intercept per yr

Year	<u>caught_1</u>	<u>caught_2</u>	<u>caught_3</u>	<u>caught_4</u>	<u>caught_5</u>	<u>caught_13</u>
2018	10	4	2	0	1	0
2019	5	0	0	0	0	0
2020	16	4	2	0	1	0
2021	14	4	1	0	1	1*

\* wp\_int = 443, all released

b)

Harvest summary

Year	<u>harvest_1</u>	<u>harvest_2</u>
2018	4	2
2019	4	0
2020	9	2
2021	6	1

# Infrequent intercepts in NJ

Atl cod

Intercepts per yr and wave

Year	W1	W2	W3	W4	W5	W6	Avg
2018		11	3	3	0	0	3
2019		2	2	0	0	1	1
2020		13	5	3	1	1	5
2021		14	5	2	0	0	4
Avg		10	4	2	0	1	

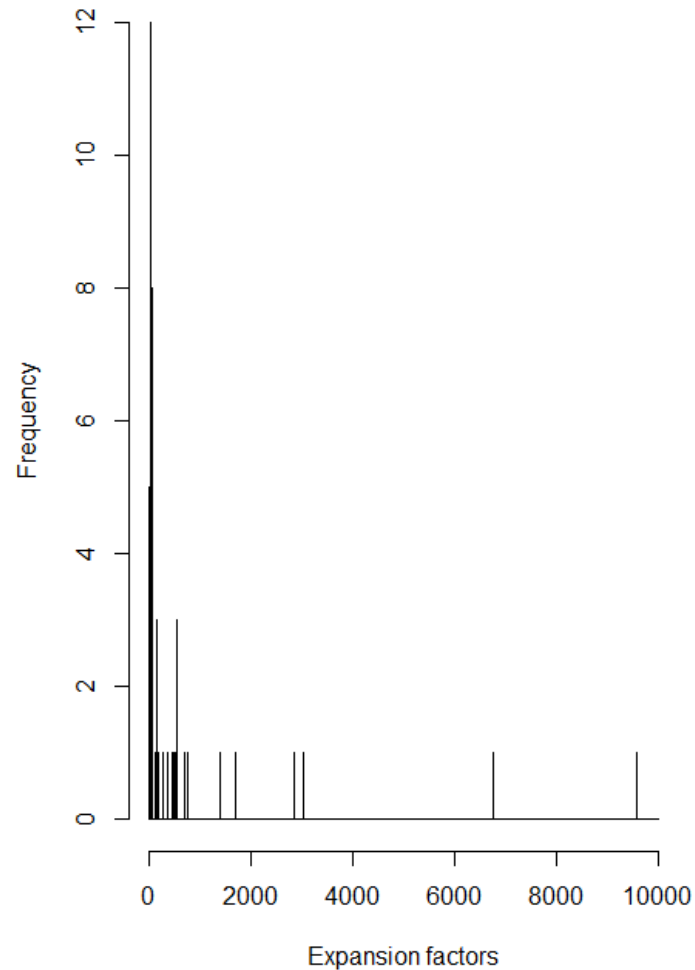
Other ex. spp. for comparison (NJ):

Intercepts per yr and wave

	Year	W1	W2	W3	W4	W5	W6
Striped bass	2018		43	123	30	74	139
Summer flounder	2018		0	375	945	200	0
BSB	2018		4	165	422	298	29

# Distribution of expansion factors

**Distribution of intercept expansion factors**  
Range = 1 to 9,578  
(2018-2021 pooled)



**Distribution of intercept expansion factors**  
(zoom in for exp factors between 1 and 1,000)

