Georges Bank Cod – 2021 Management Track Assessment

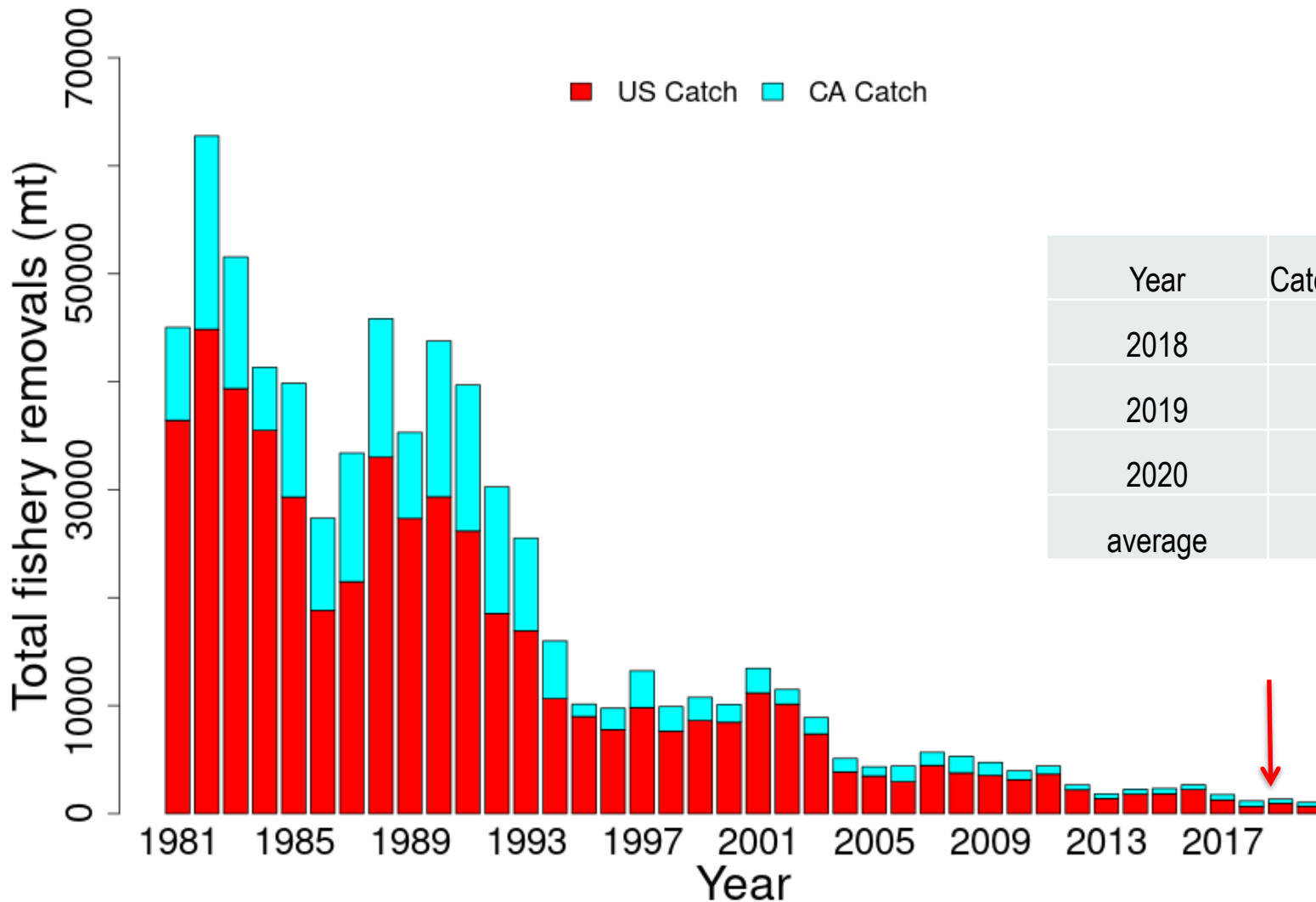## Katherine Sosebee

With lots of help from Chris Legault and Charles Peretti

NEFMC SSC Meeting

25 August 2022
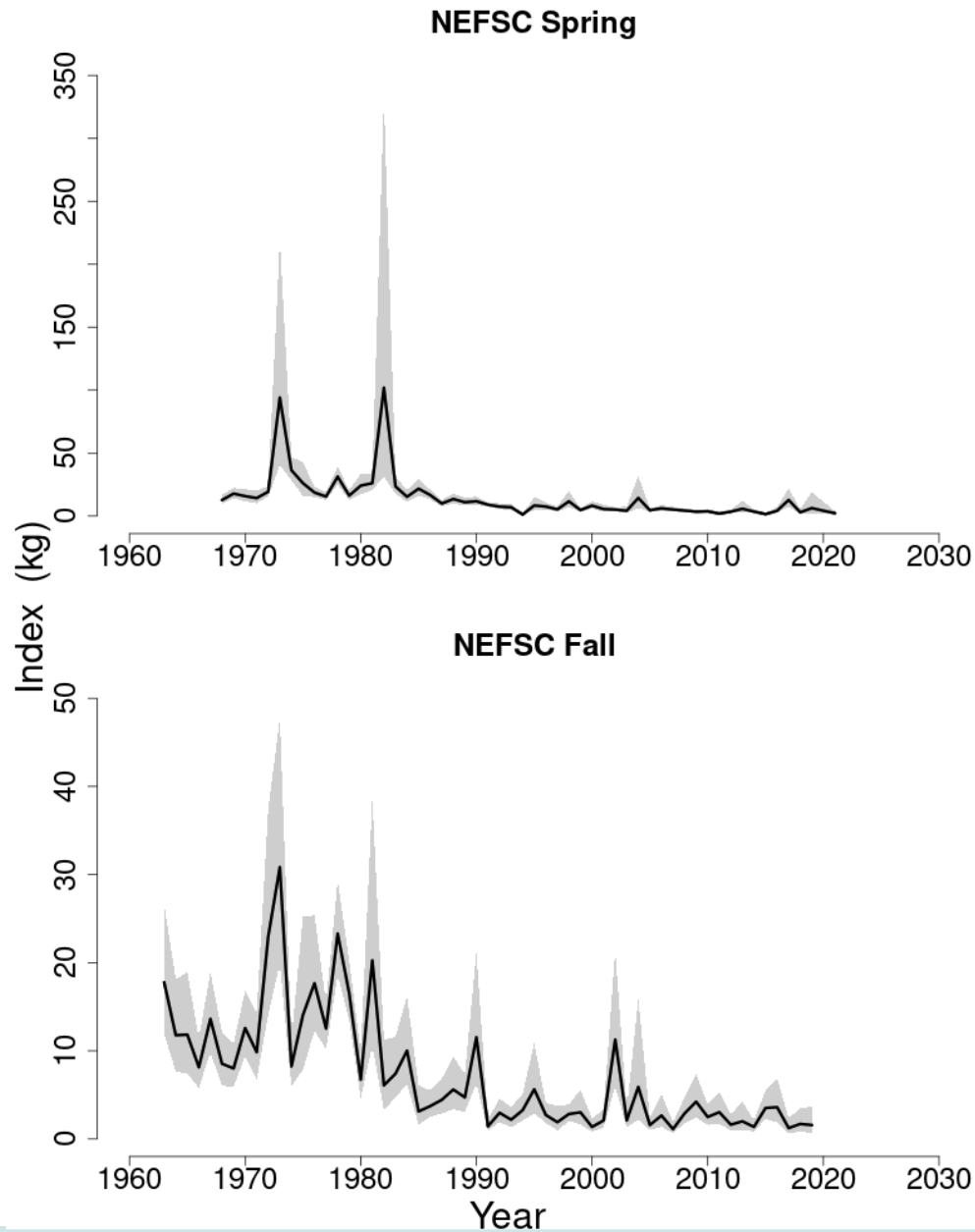
Catch

Year	Catch (mt)
2018	1,183
2019	1,344
2020	1,053
average	1,193

Surveys

NEFSC Spring

NEFSC Fall

NOAA FISHERIES

PlanBsmooth

- R package to apply agreed smoothing
  - https://github.com/cmlegault/PlanBsmooth
- Average surveys (bring fall forward one year)
- Loess smooth
  - 33 years
  - 0.3 span
- Log-linear regression of recent 3 smoothed points
  - Rate of change recently
- Retransform and apply as multiplier to average of 3 years catch

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- PlanBsmooth can handle missing information
  - Last two survey values based on one survey only
 - 2020 catch provided by Groundfish PDT

Year	Spring	Fall	Average	Catch
2018	U	V		D
2019	W	X	V,W	E
2020	NA	NA	X,NA	F
2021	A	NA	NA,A	

Simulations were run to examine the impact of missing survey data on PlanBsmooth. There were not large impacts found. This analysis and code is available on GitHub

https://github.com/cmlegault/PlanBsmooth_missing_data

GB Cod PlanBsmooth Applied

- Black dots = average survey biomass
- Blue line = loess smooth
- Grey area = 95% confidence interval for loess smooth
- Red dashed line = retransformed log-linear fit to recent 3 years of smoothed data

Georges Bank Cod

Multiplier = 0.611

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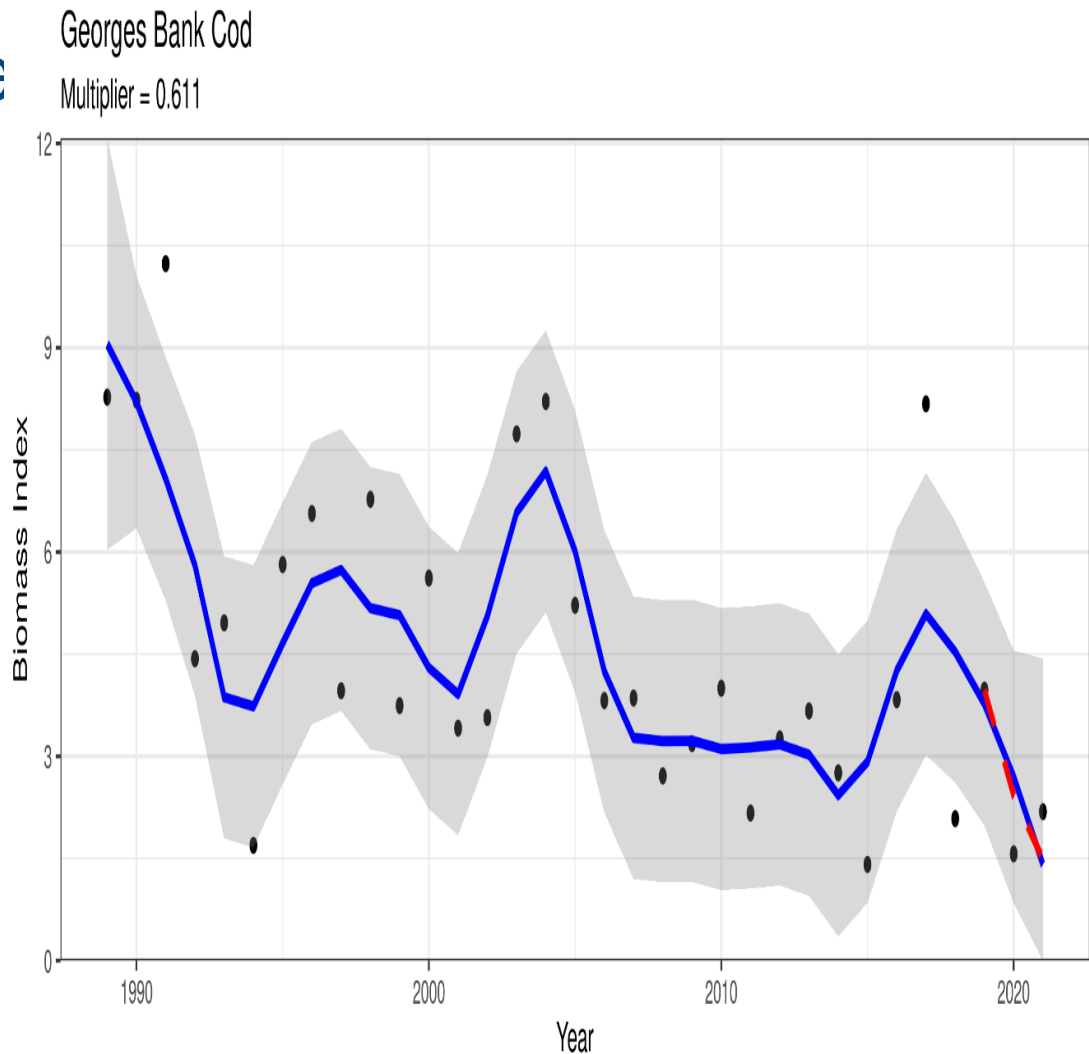
GB Cod PlanBsmooth Applied

- Average recent catches
- Apply multiplier
- Catch advice for 2022

| Year	Catch (mt)
2018	1,183
2019	1,344
2020	1,053
average	1,193
multiplier	0.611
catch advice	729

NOAA FISHERIES

PlanBsmooth caveats

- Not a dynamic model
  - No reference points or projections
  - Cannot predict future responses
- Survey noise may not be sufficiently handled by averaging surveys and using loess smooth
  - Smoothers most uncertain at ends of time series
- Large changes (multipliers) possible
- If catch not close to quota, then could have large change in quota even with multiplier close to one
- Missing data from 2020 means autumn survey only 2020 index (lagged from 2019) and spring 2021 only 2021 index.
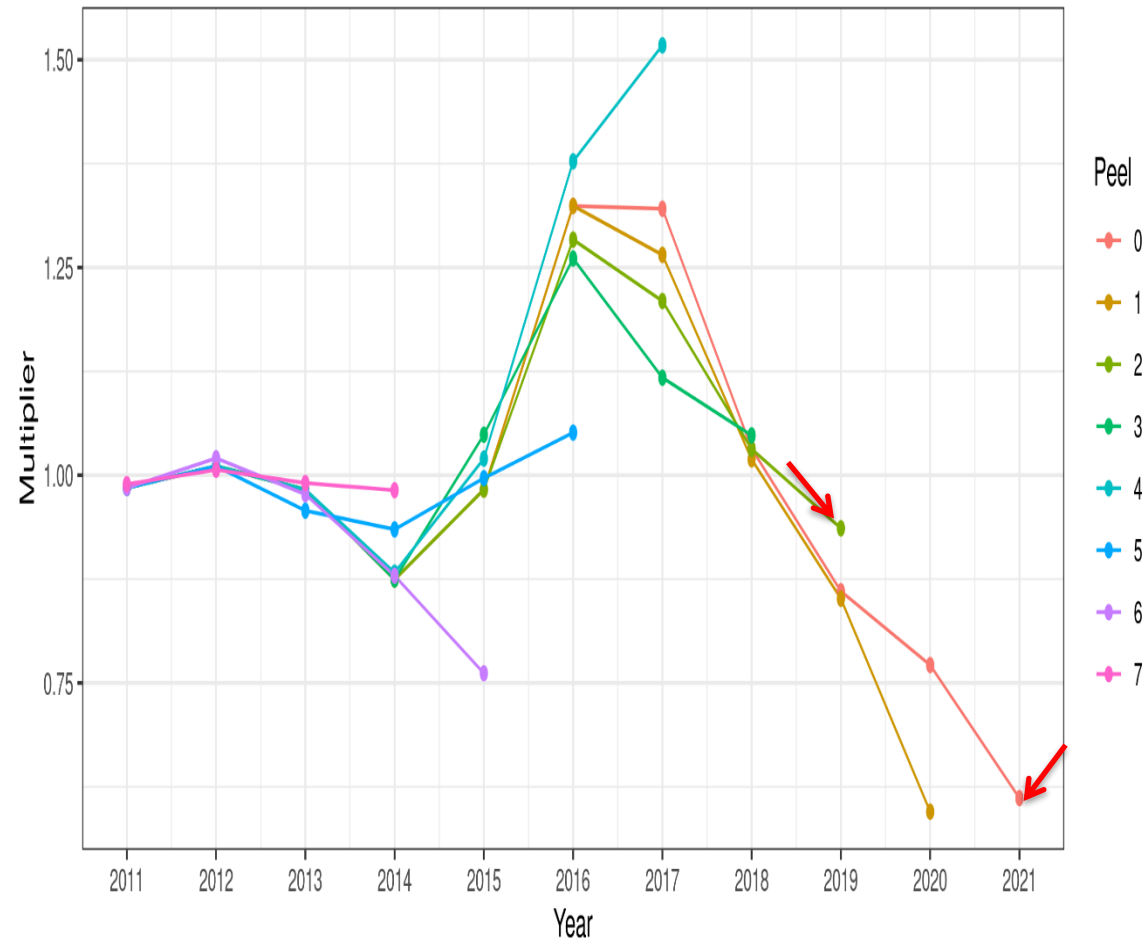
NOAA FISHERIES

GB Cod PlanBsmooth Loess Retrospective

- Small Mohn's rho - 0.072

- Peels all within CI

- No directional pattern
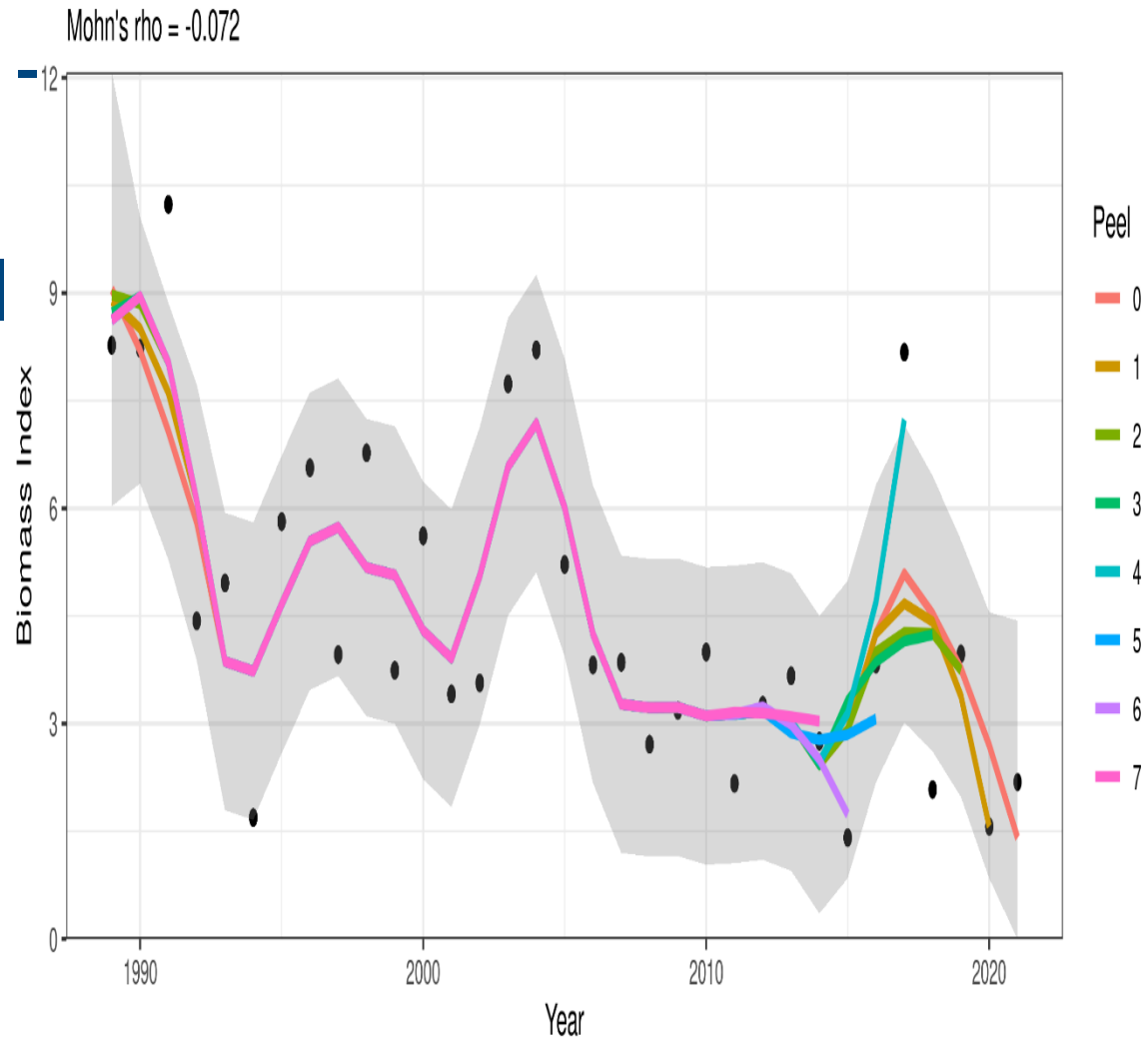
GB Cod PlanBsmooth Multiplier Retrospective

- No systematic pattern

- Change from last update: 2019 multiplier was 0.936

Sensitivity Run

Without imputing

Year	Spring	Fall	Average	Catch
2018	U	V		D
2019	W	X	V,W	E
2020	NA	NA	X,NA	F
2021	A	NA	NA,A	

Year	Spring	Fall	Average	Catch
2018	2.94	1.69		D
2019	6.25	1.57	3.97	E
2020	NA	NA	1.57	F
2021	2.19	NA	2.19	

With imputing
2020 fall = 2019 fall
2020 spring = avg(2019 and 2021)

Year	Spring	Fall	Average	Catch
2018	U	V		D
2019	W	X	V,W	E
2020	Avg(W,A)	X	X,avg(W,A)	F
2021	A	NA	X,A	

Year	Spring	Fall	Average	Catch
2018	2.94	1.69		D
2019	6.25	1.57	3.97	E
2020	4.22	1.57	2.89	F
2021	2.19	NA	1.88	

Sensitivity Run

Georges Bank Cod
Multiplier = 0.611
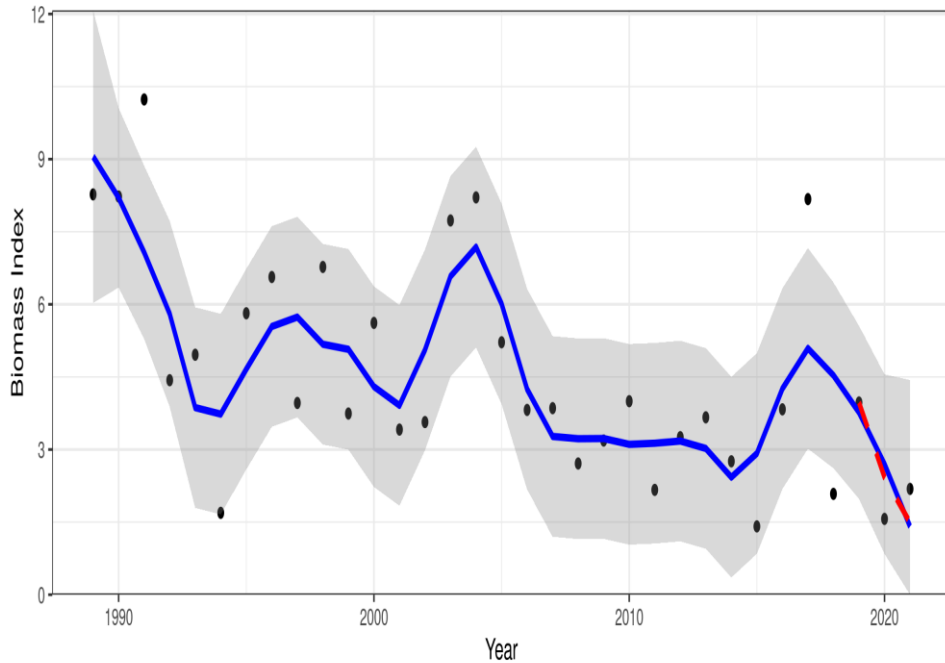
Georges Bank Cod
Multiplier = 0.632
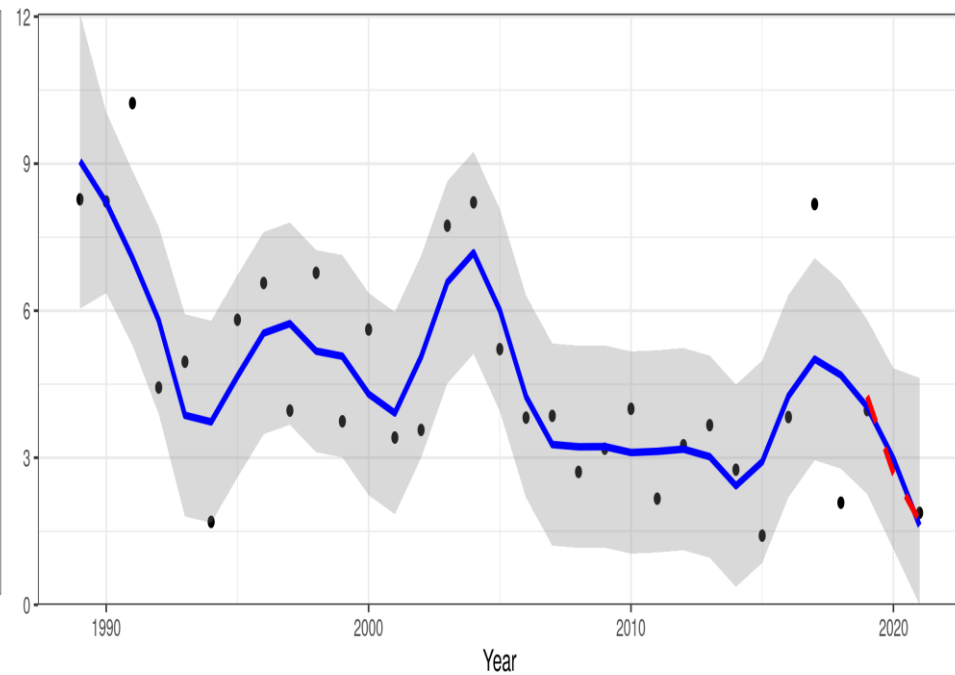
Year	Catch (mt)		Catch (mt)
2018	1,183		1,183
2019	1,344		1,344
2020	1,053		1,053
average	1,193		1,193
multiplier	0.611		0.632
catch advice	729		754

Questions?