



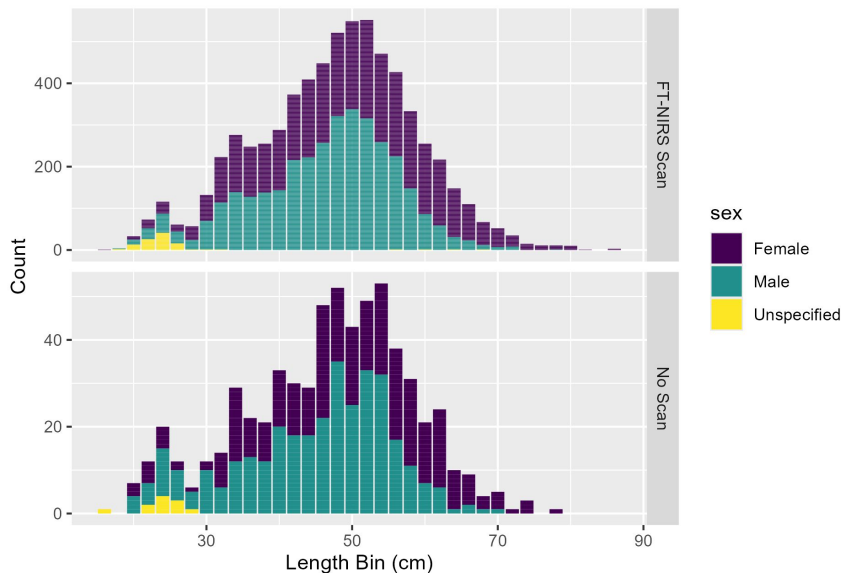
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FISHERIES

Model sensitivities for sablefish exploring the impact of traditional age reads versus FT-NIRS ages

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Northwest Fisheries Science Center
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Number of Samples by Ageing Method

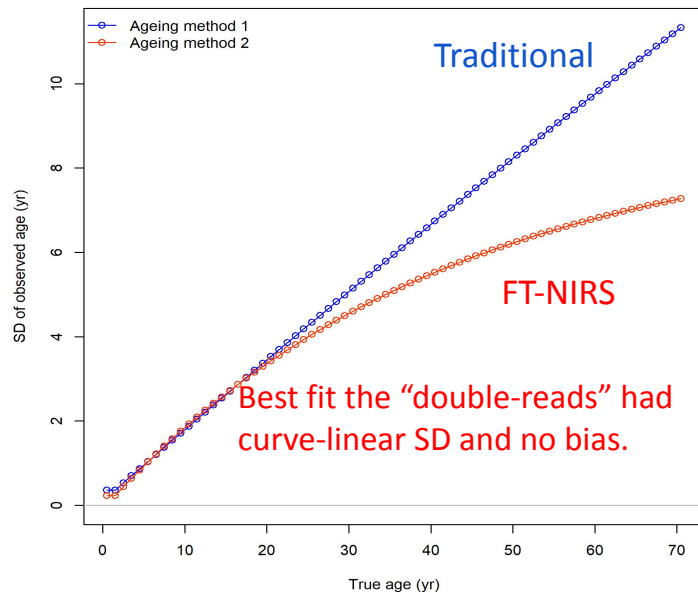
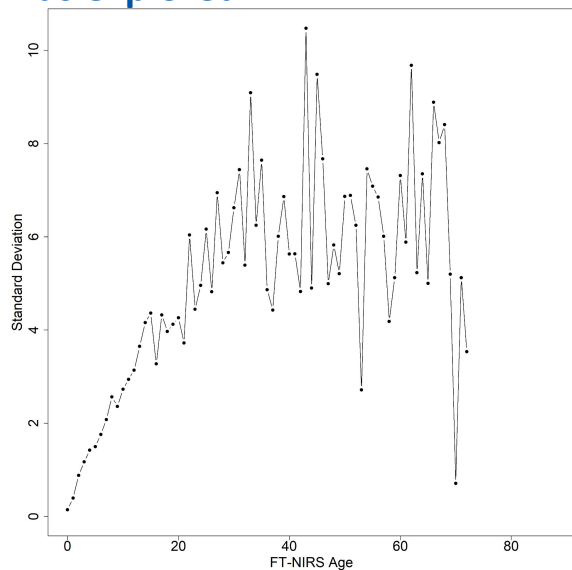
- Available otoliths collected by the NWFSC West Coast Groundfish Bottom Trawl (WCGBT) survey between 2017-2022 were read by both traditional (BB) and FT-NIRS ageing methods.
 - A second otolith to support scanning was not available for all aged fish.



Year	FT-NIR Scanned	No Scan
2017	1,099	121
2018	1,322	162
2019	749	130
2021	2,063	119
2022	1,552	112
Total	6,785	664

Ageing Error

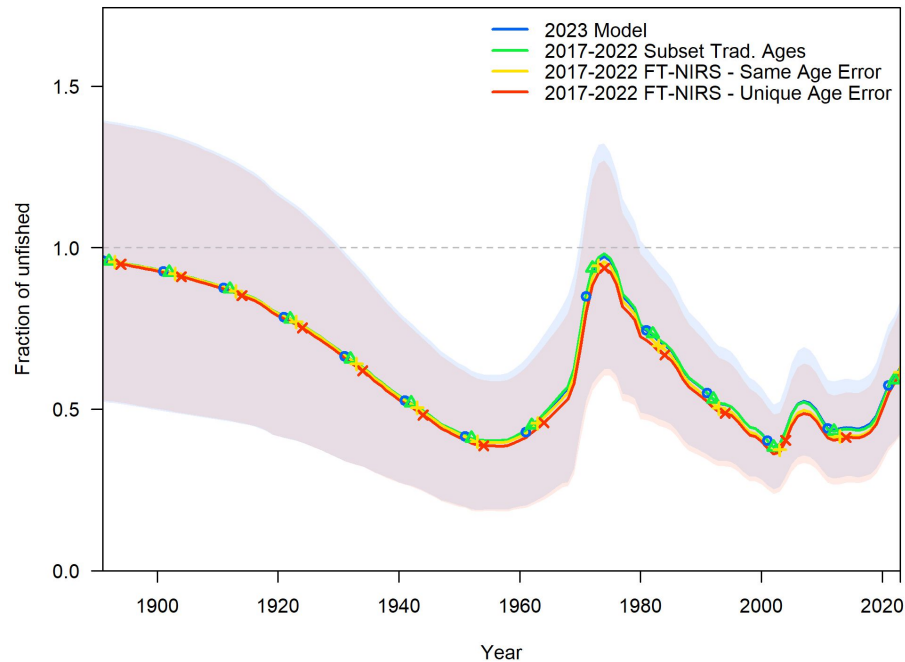
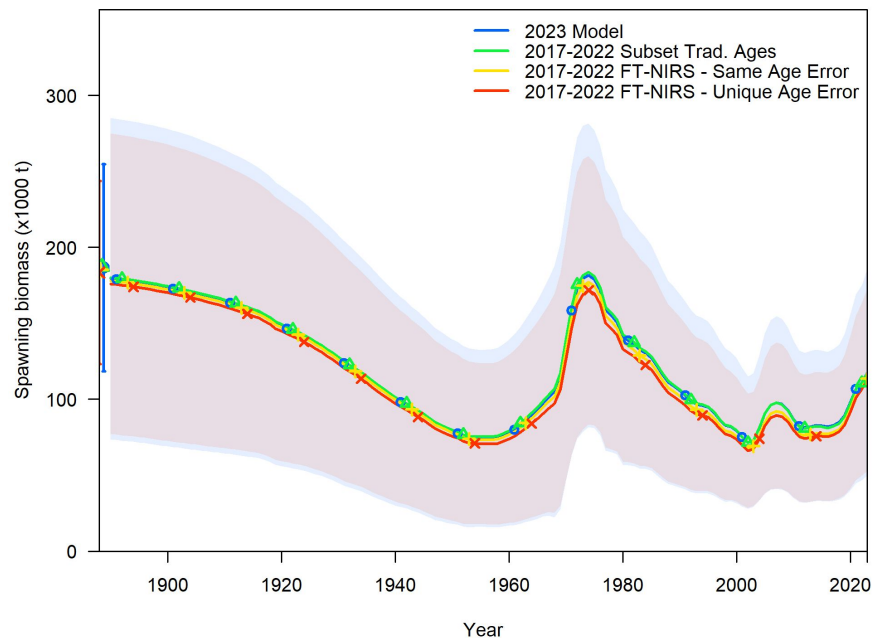
- Ageing error was estimated for FT-NIRS by assuming the traditional age was the first read and the FT-NIRS was the second read.
 - The traditional age (first read) was assumed to be unbiased.
- Alternative forms for the change in standard deviation across age and bias in the true age was explored.



Sensitivities

- A number of sensitivities were conducted exploring the impact of traditional vs. FT-NIRS ages on model estimates within the 2023 sablefish assessment model:
 1. Subset the traditional ages from 2017-2022 to include only those with a FT-NIRS age. Include the traditional ages in the form of conditional-age-at-length (CAAL) data in the model.
 2. Include only FT-NIRS ages from 2017-2022 as CAAL data in the model. Apply the same ageing error vector estimated based on the traditional age double-reads.
 3. Include only FT-NIRS ages from 2017-2022 as CAAL data in the model. Estimate and apply a unique ageing error vector to these data.
- All model use the same data weights.

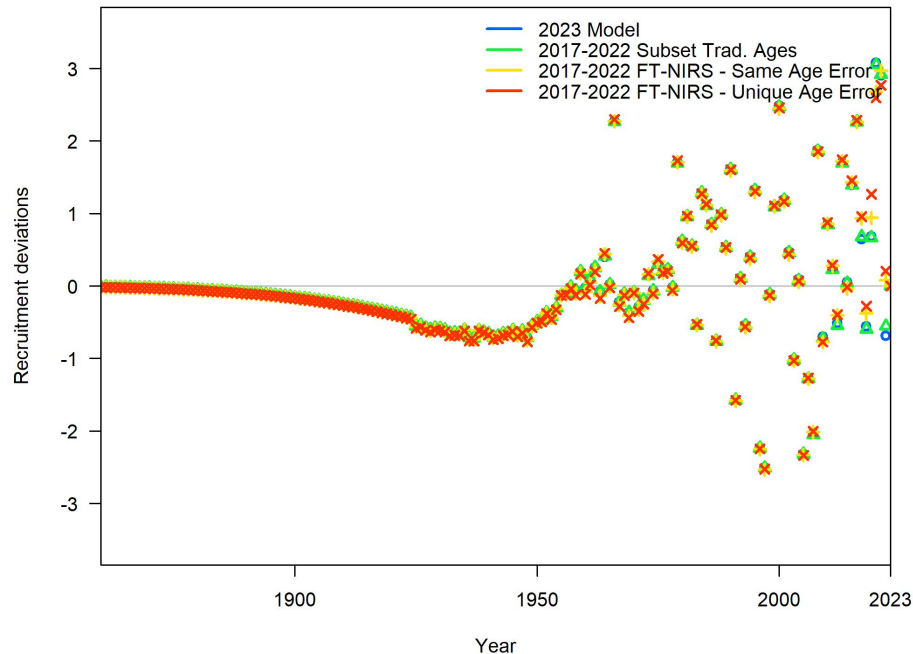
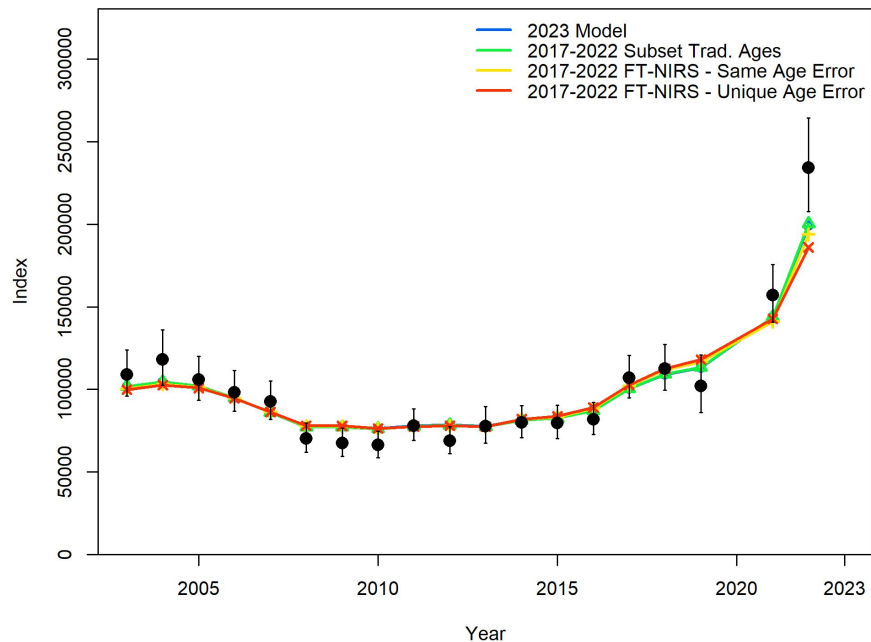
Spawning Biomass and Fraction Unfished



Likelihood

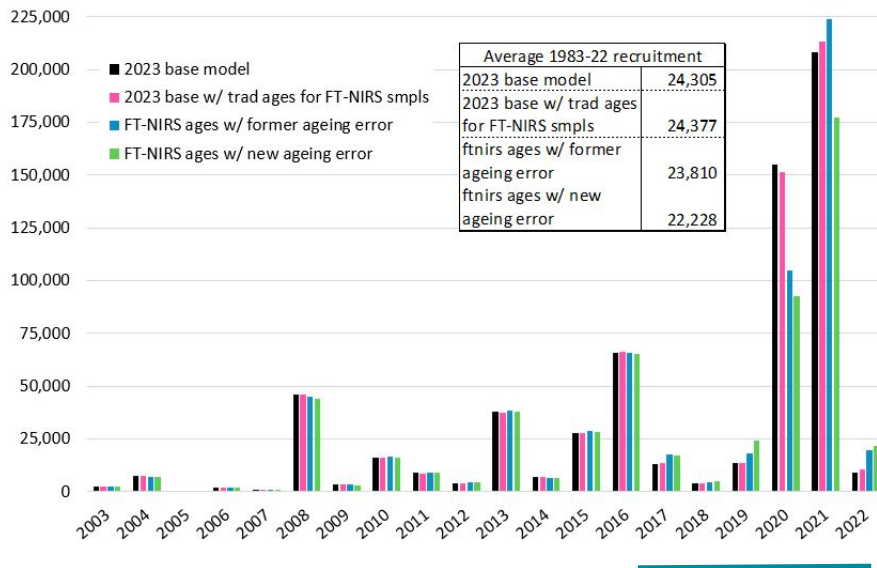
Likelihood Component	Base	Subset Traditional Ages	FT-NIRS	FT-NIRS & Ageing Error
TOTAL	2496	2467	2474.1	2469.1
Survey	-4.7	-5.4	-2.2	0.2
Discard	-110.4	-112.2	-116.7	-117.2
Mean Body Weight	-25.8	-26.1	-24.3	-22.9
Length Comp.	180.6	180.2	183.6	184.1
Age Comp.	2415.9	2390.4	2393.9	2384.9
Recruitment	40.1	39.9	39.7	39.9
Parameter Priors	0.2	0.3	0.3	0.2

Fit to the NWFSC WCGBT survey and Recruitment Deviation Estimates

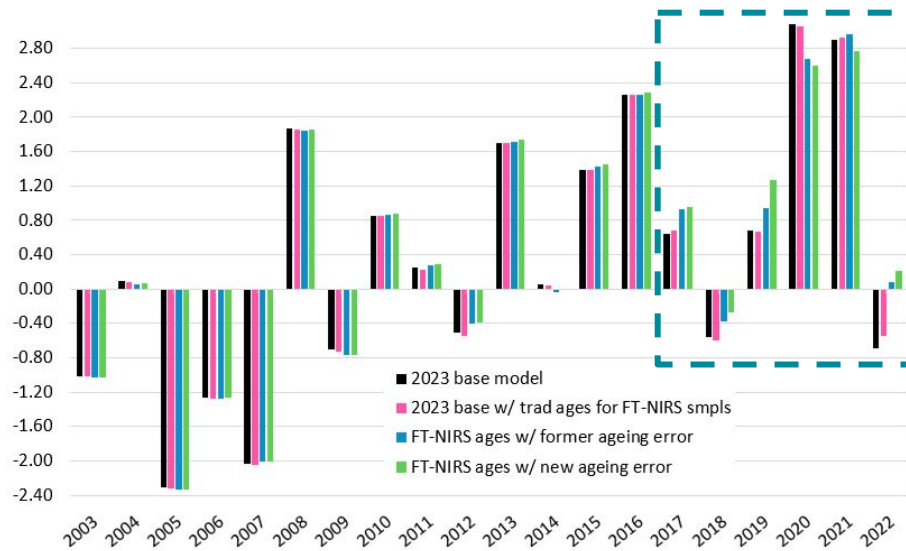


Recruitment and Recruitment Deviations

Recruitment



Recruitment Deviations

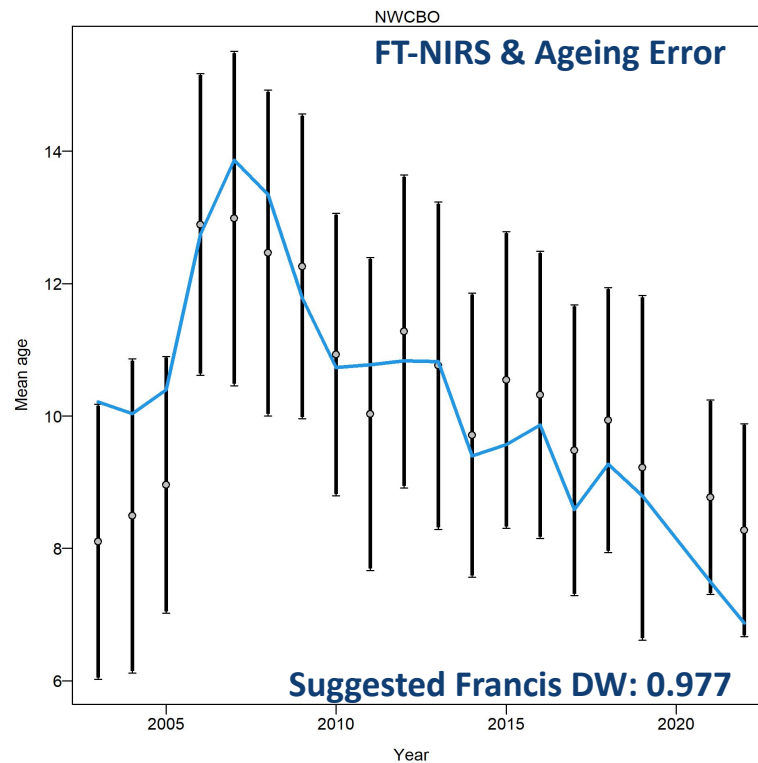
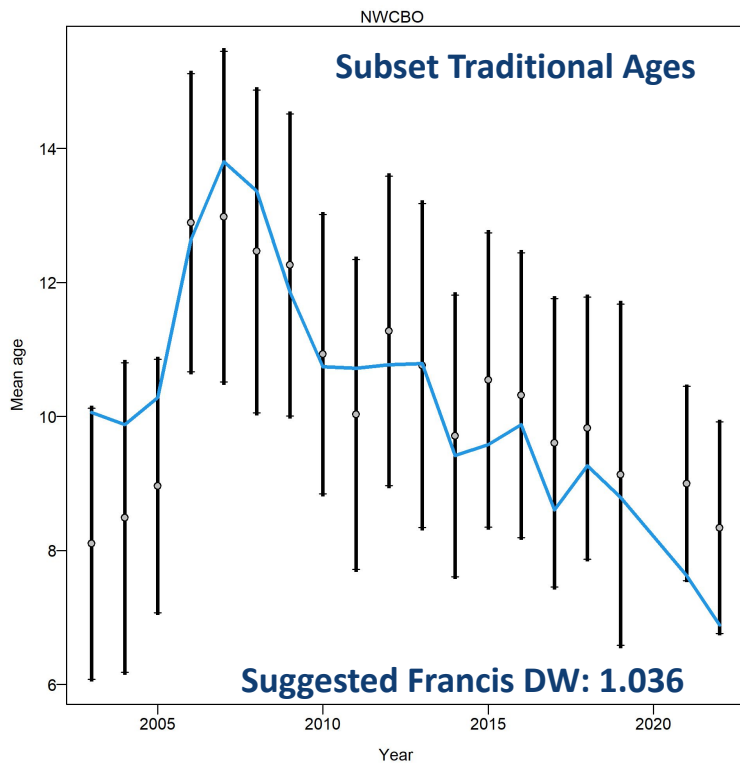


Parameter Estimates

Parameter	Base	Subset Traditional Ages	FT-NIRS	FT-NIRS & Ageing Error
NatM_uniform_Fem_GP_1	0.0711	0.0717	0.0712	0.0701
L_at_Amin_Fem_GP_1	25.26	25.24	25.59	25.68
L_at_Amax_Fem_GP_1	61.13	61.19	60.98	61.05
VonBert_K_Fem_GP_1	0.367	0.367	0.359	0.354
CV_young_Fem_GP_1	0.058	0.059	0.059	0.061
CV_old_Fem_GP_1	0.103	0.103	0.103	0.103
NatM_uniform_Mal_GP_1	0.0592	0.0597	0.0599	0.0592
L_at_Amin_Mal_GP_1	26.62	26.67	26.96	27.07
L_at_Amax_Mal_GP_1	56.11	56.13	56.22	56.25
VonBert_K_Mal_GP_1	0.381	0.381	0.367	0.362
CV_young_Mal_GP_1	0.070	0.071	0.070	0.074
CV_old_Mal_GP_1	0.078	0.078	0.076	0.076
SR_LN(R0)	9.8758	9.8836	9.8895	9.8567
LnQ_base_NWCBO(7)	-0.5951	-0.5873	-0.5714	-0.5458

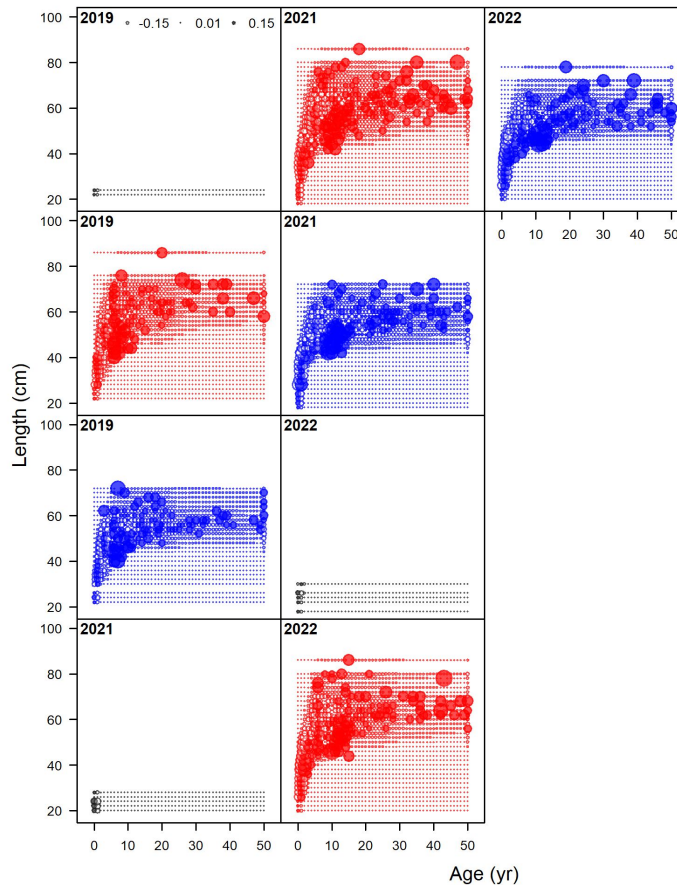
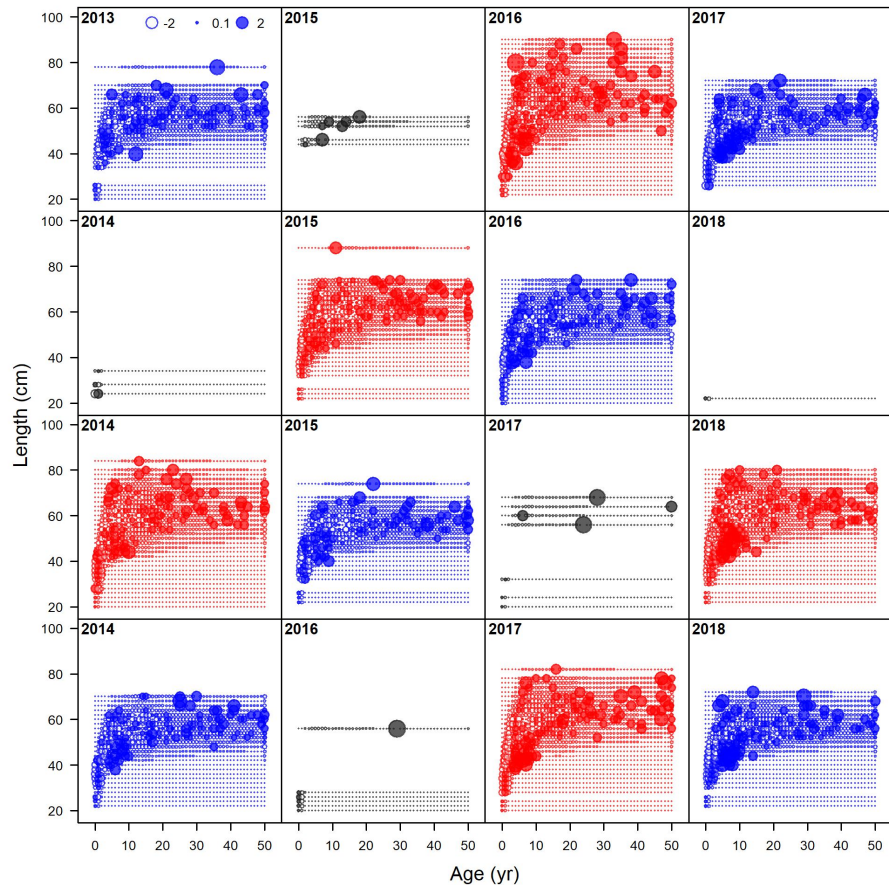
Extra Slides

CAAL Mean Age Fits

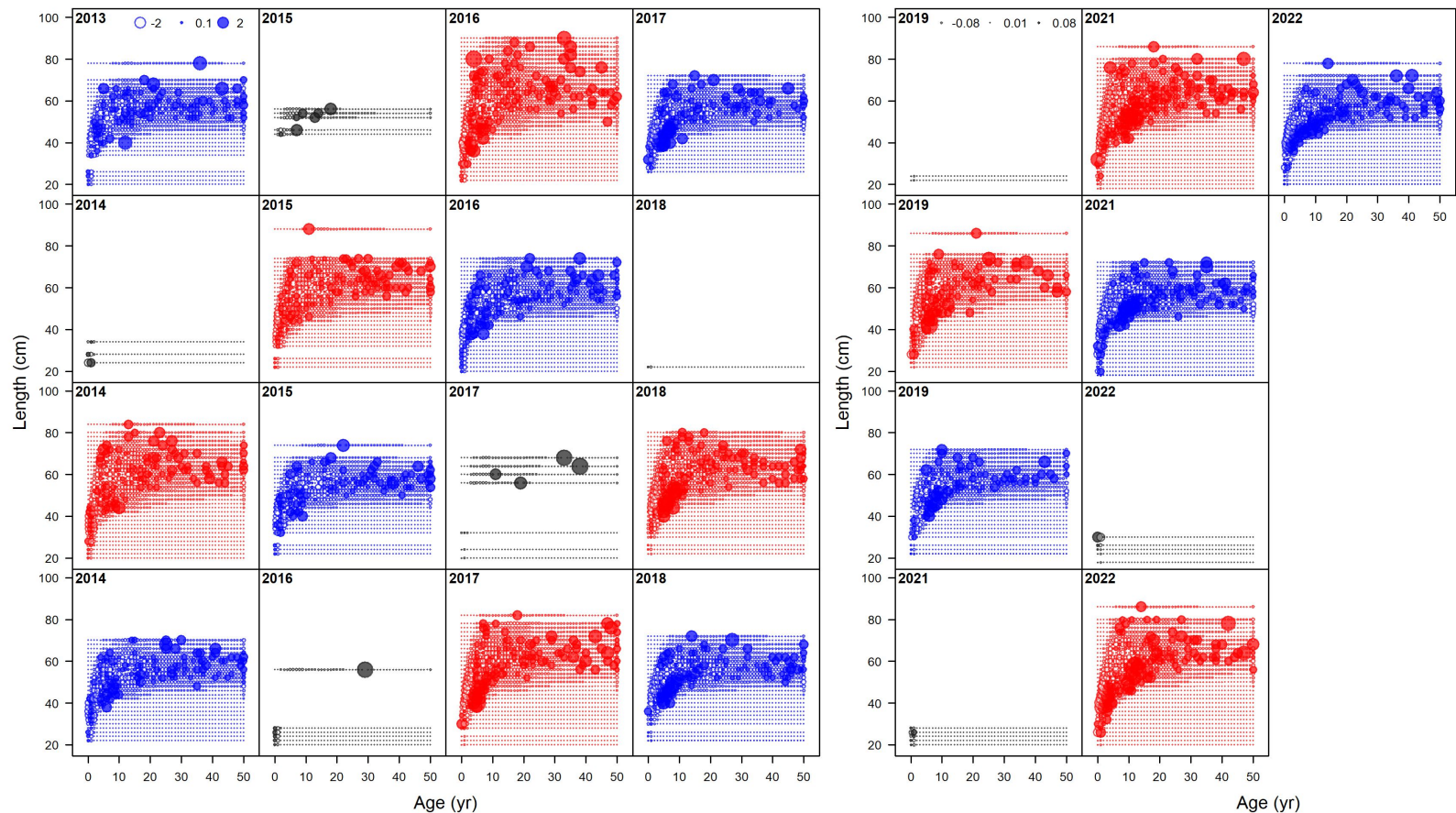


Base Model Francis DW: 1.001

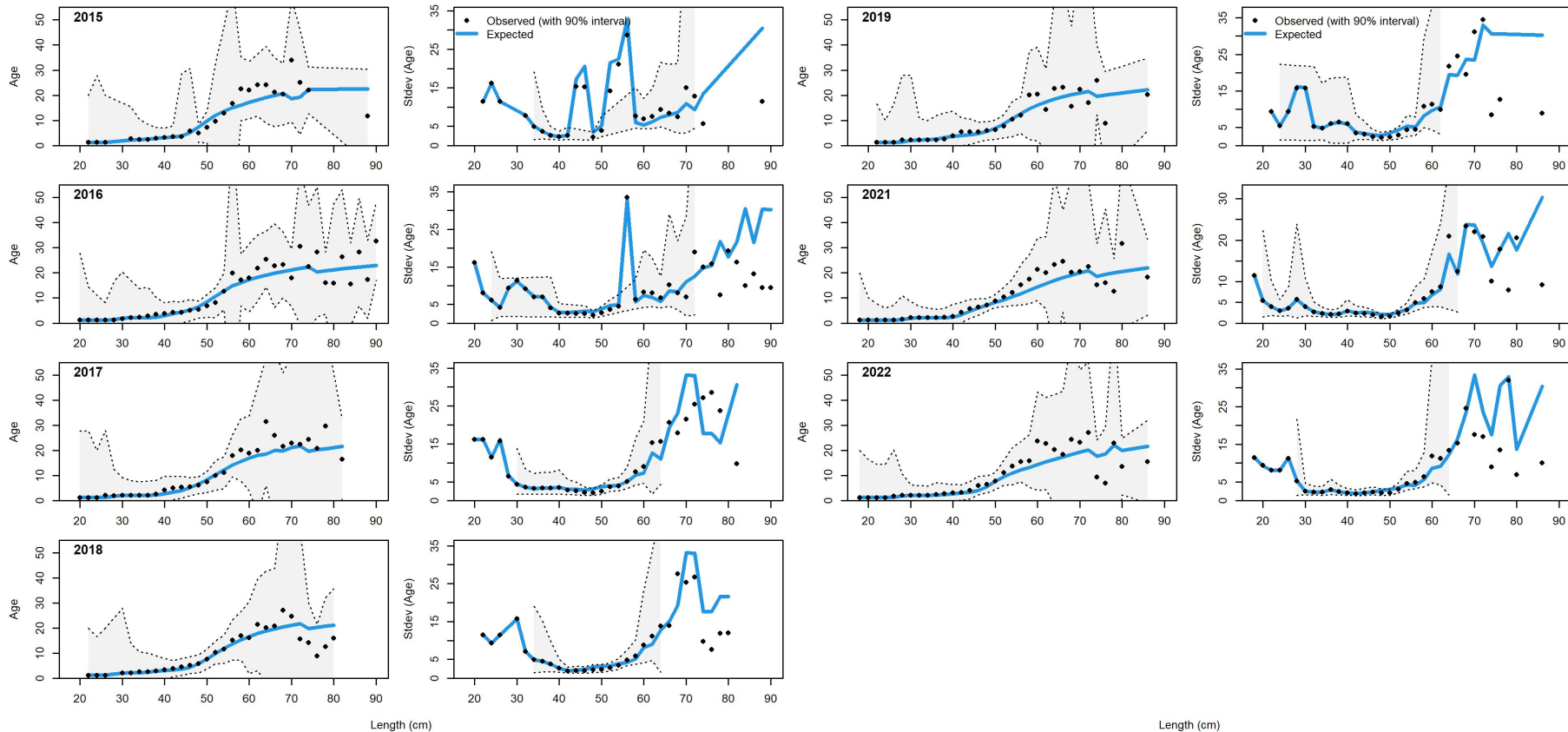
Subset Traditional Ages



FT-NIRS Ages with Ageing Error



Subset Traditional Ages



FT-NIRS Ages with Ageing Error

