Table 9. The major parameters and input required to initialize and execute the miscellaneous models, with notations of the major structural features.

			Data description	Inputs Static (S) or Dynamic (D)	Spatially resolved (Y or N) [does not mean it is not done for different regions, but	units	Origin, source, or method for derivation of value	Variance incorporated (Y or N)	Timeframe for derivation of value
Model Class	Misc								
	Model	AAC			N				N/A; for NEUS derived from data in 1973-2004
		Required Inputs							
		DC_{ij}	Percentage of each prey as proportion of a predator's diet composition	S		Unitless (proportion)	food habits data	N	
		r_i	Growth rate	S		Unitless	Survey data, age data	N	
		N (or B)	Abundance or biomass	S		biomass (metric tons) or #	Survey data	N	
		Required Parameters							
		E_i	Assimilation Efficiency; Proportion of what predator eats that is used for growth.	S		Unitless (proportion)	Literature	N	
		C_i	Clearance rate; maximum ingestion rate by a predator, more commonly understood as handling time	S		biomass per day	food habits data	N	
		S_i	Consumption rate; derived from mean stomach contents	S		biomass per day (per unit predator biomass)	food habits data	N	

Table 9, continued. The major parameters and input required to initialize and execute the miscellaneous models, with notations of the major structural features.

			Data description	Inputs Static (S) or Dynamic (D)	Spatially resolved (Y or N) [does not mean it is not done for different regions, but directly in the model]	units	Origin, source, or method for derivation of value	Variance incorporated (Y or N)	Timeframe for derivation of value
Model Class	Misc								
	Model	Donut Selectivity Model			N				N/A, for NEUS based on data from 1973-1999
		Required Inputs							
		P_{ij}	relative prey abundance	S		unitless	Survey data, process studies	N	
		O_{ij}	Overlap	S		unitless	Survey data	N	
		Required Parameters							
		Rd_{ij}	Detection rank	S		rankings	1st principles, food habits data	N	
		Rr_{ij}	Reaction rank	S		rankings	1st principles, food habits data	N	
		Rc_{ij}	Capture rank	S		rankings	1st principles, food habits data	N	
		Ri_{ij}	Ingestion rank	S		rankings	1st principles, food habits data	N	
		$R1_{ij}$	"Icing" rank	S		rankings	1st principles, food habits data	N	

Table 9, continued. The major parameters and input required to initialize and execute the miscellaneous models, with notations of the major structural features.

			Data description	Inputs Static (S) or Dynamic (D)	Spatially resolved (Y or N) [does not mean it is not done for different regions, but directly in the model]	units	Origin, source, or method for derivation of value	Variance incorporated (Y or N)	Timeframe for derivation of value
Model Class	Misc								
	Model	PSA							
		Required Inputs-Productivity			N			Can be in form of rank certainties, but usually not	N/A; for NEUS derived from data in 1973-2006
			r, intrinsic rate of growth	S		rankings	Survey data, age data	N	
			Maximum Age	S		rankings	Survey data, age data	N	
			Maximum Size	S		rankings	Survey data, age data	N	
			von Bertalanffy Growth Coefficient (k)	S		rankings	Survey data, age data	N	
			Estimated Natural Mortality	S		rankings	food habits data	N	
			Measured Fecundity	S		rankings	Age data	N	
			Breeding Strategy	S		rankings	Age data	N	
			Recruitment Pattern	S		rankings	Survey data, age data	N	
			Age at Maturity	S		rankings	Age data	N	
			Mean Trophic Level	S		rankings	food habits data	N	

Table 9, continued. The major parameters and input required to initialize and execute the miscellaneous models, with notations of the major structural features.

			Data description	Inputs Static (S) or Dynamic (D)	Spatially resolved (Y or N) [does not mean it is not done for different regions, but directly in the model]	units	Origin, source, or method for derivation of value	Variance incorporated (Y or N)	Timeframe for derivation of value
Model Class	Misc								
	Model	PSA							
		Required Inputs-Susceptibility							
			Management Strategy	S		rankings	Mgt Plans, Socioeconomic data	N	
			Areal Overlap	S		rankings	Survey data, Landings data	N	
			Geographic Concentration	S		rankings	Survey data, Landings data	N	
			Vertical Overlap	S		rankings	Survey data, Landings data	N	
			Fishing rate relative to M	S		rankings	derived	N	
			Biomass of Spawners (SSB) or other proxies	S		rankings	Survey data	N	
			Seasonal Migrations	S		rankings	Survey data	N	
			Schooling/Aggregation and Other Behavioral Responses	S		rankings	Survey data	N	
			Morphology Affecting Capture	S		rankings	Survey data	N	
			Survival After Capture and Release	S		rankings	process studies, Literature	N	
			Desirability/Value of the Fishery	S		rankings	Economic data	N	
			Fishery Impact to EFH or Habitat in General for Non-targets	S		rankings	process studies, Literature	N	

Table 9, continued. The major parameters and input required to initialize and execute the miscellaneous models, with notations of the major structural features.

			Data description	Inputs Static (S) or Dynamic (D)	Spatially resolved (Y or N) [does not mean it is not done for different regions, but directly in the model]	units	Origin, source, or method for derivation of value	Variance incorporated (Y or N)	Timeframe for derivation of value
Model Class	Misc								
	Model	LeMans							Variable, is a simulator, but set up for GB based on data from 1963-2000; ran for 25 years
		Required Inputs			N				
		$L_{i,t}$	length	S		cm	Survey data, age data	N	
		k_i	growth rate	S		rate	Survey data, age data	N	
		S_i	Spawning stock biomass	D		biomass	Survey data, age data	N	
		R_i	recruits	D		#	Survey data, age data	N	
		$N_{i,j}$	Abundance at size	D		#	Survey data, age data	N	
		DC_{ij}	Diet composition	S		unitless	food habits data	N	
		Required Parameters							
		a_i	The intercept parameter of the length–weight relationship for species i	S		unitless	derived	N	
		b_i	The slope parameter of the length–weight relationship for species i	S		unitless	derived	N	
		$L_{\infty,i}$	Asymptotic length parameter of the von Bertalanffy growth equation	S		cm	derived	N	
		k_i	Growth parameter of the von Bertalanffy growth equation	S		rate	derived	N	

Table 9, continued. The major parameters and input required to initialize and execute the miscellaneous models, with notations of the major structural features.

			Data description	Inputs Static (S) or Dynamic (D)	Spatially resolved (Y or N) [does not mean it is not done for different regions, but directly in the model]	units	Origin, source, or method for derivation of value	Variance incorporated (Y or N)	Timeframe for derivation of value
Model Class	Misc								
	Model	LeMans							
		Required Parameters							
		$\phi_{i,j}$	The proportion of species i in size class j that move to the next size class in a single time step	S		unitless	Survey data, age data	N	
		α_i	Productivity parameter of the Ricker stock–recruitment equation for species i	S		unitless	derived	N	
		β_i	Density dependence parameter of the Ricker stock-recruitment equation for species i	S		biomass	derived	N	
		$S_{max,i}$	The maximum observed spawning stock biomass of species i	S		biomass	Survey data, age data	N	
		κ_i	Curvature parameter for the maturity ogive of species i	S		unitless	derived	N	
		L_{M50}	The length at which 0.5 of species i are mature	S		cm	Survey data, age data	N	
		$\omega_{i,j}$	The proportion of species i in size class j that are mature	S		unitless	Survey data, age data	N	
		$F_{i,j}$	Instantaneous rate of fishing mortality on species i in size classj	S		rate	derived	N	

Table 9, continued. The major parameters and input required to initialize and execute the miscellaneous models, with notations of the major structural features.

			Data description	Inputs Static (S) or Dynamic (D)	Spatially resolved (Y or N) [does not mean it is not done for different regions, but directly in the model]	units	Origin, source, or method for derivation of value	Variance incorporated (Y or N)	Timeframe for derivation of value
Model Class	Misc								
	Model	LeMans							
		φ_i	A binary variable indicating whether species i is fished	S		unitless	Landings data	N	
		F_{max}	The maximum annual fishing mortality rate for a fully recruited fish	S		unitless	derived	N	
		η	Steepness parameter for the fishing selectivity ogive	S		unitless	Survey data, age data, Landings data	N	
		L_{F50}	The length at which 0.5 selection by the fishery occurs	S		cm	Survey data, age data, Landings data	N	
		$M1_{i,j}$	Natural (nonmodelled) mortality for species i in size classj	S		rate	derived	N	
		Ψ,υ	Parameters of the beta distribution for M1	S		unitless	derived	N	
		$M2_{i,j}$	Predation mortality for species i in size classj	S		rate	derived	N	
		$\tau_{m,i}$	The preference for prey species m by predator species i	S		unitless	food habits data	N	
		$\zeta_{n,j}$	Size preference for prey of size n by predator of size j	S		unitless	food habits data	N	

Table 9, continued. The major parameters and input required to initialize and execute the miscellaneous models, with notations of the major structural features.

			Data description	Inputs Static (S) or Dynamic (D)	Spatially resolved (Y or N) [does not mean it is not done for different regions, but directly in the model]	units	Origin, source, or method for derivation of value	Variance incorporated (Y or N)	Timeframe for derivation of value
Model Class	Misc								
	Model	LeMans							
		$v_{i,j,m,n}$	The relative preference (suitability) for predator i of size j of prey m of size n	S		unitless	food habits data	N	
		$I_{i,j}$	The ration (ingestion rate) that must be consumed by species i in size class j to account for modeled growth in a given time step	S		biomass	food habits data	N	
		Ge_j	The growth efficiency (proportion of food consumed that is converted to body mass) of fish in size class j	S		unitless	Literature	N	

Table 9, continued. The major parameters and input required to initialize and execute the miscellaneous models, with notations of the major structural features.

			Data description	Inputs Static (S) or Dynamic (D)	Spatially resolved (Y or N) [does not mean it is not done for different units	Origin, source, or method for derivation of value	Variance incorporated (Y or N)	Timeframe for derivation of value
Model Class	Misc							
	Model	Size Spectra			N			Variable, in NEUS usually 40+ yrs (1963-present)
		Required Inputs						
		B per size unit	biomass (or sometimes abundance)	can be both	mass or mass per unit area	Survey data, Age data, Landings data, food habits data	N	
		log of size	size bins	can be both	length, often cm or derivatives thereof	Survey data	N	
		Required Parameters						
		β	slope	S	unitless	derived	Y	
		α	intercept	S	unitless	derived	Y	
Model Class	Misc							
	Model	CCA/CanCorr/RDA			Can be, usually not			Variable, in NEUS, usually 40+ yrs (1963-present)
		Required Inputs						
		Y	Matrix of times series of various response -- usually biotic (e.g. fish abunances)-- variables	D	various	Survey data, Age data, Landings data, food habits data, Oceanographic Data, Climatological Data, Economic Data	Y	
		X	Matrix of times series of various explanatory- usually human (e.g. landings), and environmental (e.g. SST)-- variables	D	various	Survey data, Age data, Landings data, food habits data, Oceanographic Data, Climatological Data, Economic Data	Y	
		Required Parameters						
		U	Eigenvectors to establish canonical "regression"	S	unitless	derived	Y	
		Y^U	fitted canonical response	S	unitless	derived	Y	

Table 9, continued. The major parameters and input required to initialize and execute the miscellaneous models, with notations of the major structural features.

			Data description	Inputs Static (S) or Dynamic (D)	Spatially resolved (Y or N) [does not mean it is not done for different regions, but directly in the model]	units	Origin, source, or method for derivation of value	Variance incorporated (Y or N)	Timeframe for derivation of value
Model Class	Misc								
	Model	DFA/MAFA			Can be, usually not				Variable, in NEUS, usually 40+ yrs (1963-present)
		Required Inputs							
		Y	Matrix of times series of various response -- usually biotic (e.g. fish abunances)-- variables	D		various	Survey data, Age data, Landings data, food habits data, Oceanographic Data, Climatological Data, Economic Data	Y	
		X	Matrix of times series of various explanatory- usually human (e.g. landings), and environmental (e.g. SST)-- variables	D		various	Survey data, Age data, Landings data, food habits data, Oceanographic Data, Climatological Data, Economic Data	Y	
		Required Parameters							
		$\mathbf{Z_t}$	trend/s relating across MV time series canonical relationships	S		unitless	derived	Y	

Table 9, continued. The major parameters and input required to initialize and execute the miscellaneous models, with notations of the major structural features.

			Data description	Inputs Static (S) or Dynamic (D)	Spatially resolved (Y or N) [does not mean it is not done for different regions, but directly in the model]	units	Origin, source, or method for derivation of value	Variance incorporated (Y or N)	Timeframe for derivation of value
Model Class	Misc								
	Model	PCA/MDS			Can be, usually not				Variable, in NEUS, usually 40+ yrs (1963-present)
		Required Inputs							
		$\mathbf{A_i}$	Matrix of times series of various biotic (e.g. fish abunances), human (e.g. landings), and environmental (e.g. SST) variables	D		various	Survey data, Age data, Landings data, food habits data, Oceanographic Data, Climatological Data, Economic Data	Y	
		Required Parameters							
		λ	Eigenvalues to derive component scores & weighting	S		unitless	derived	Y	
		$\boldsymbol{\mu}$	Eigenvectors to derive principal canonical axes	S		unitless	derived	Y	