

Table 6. The major parameters and input required to initialize and execute the Aggregate Production class of models, with notations of the major structural features.

Model Class	Aggregate Production	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	AggPROD v of MS PROD			N			Variable, is a simulator, but typically based on data from 1963-2010; 30-50 yr runs
	Required Inputs						
	N_i	Biomass or abundance of each group, i.	D		biomass (mt) or numbers per year	Survey data	N
	S_{ij}	Spatial overlap between each pair of stocks, i and j.	S		unitless	Survey data	N
	PelDem	Pelagic or demersal designation	S		unitless proportion (usually 1 or 0)	Survey data	N
	Required Parameters						
	r_i	Growth rate for each stock, i.	S		unitless	Survey data, age data, Assessment models	Y (if stochasticity used)
	K_g	Carrying capacities for each guild, g.	S		biomass (mt) or numbers	Survey data, Assessment models	N
	K_s	System carrying capacity	S		biomass (mt) or numbers	Survey data, Assessment models	N
	α_{ij}	Aggregate predation interaction strength between each predator guild, j, and prey guild, i.	S		unitless	Food habits data, Literature	N
	β_{ij}	Between guild competition coefficients of each guild j on each guild i.	S		unitless	Food habits data, Literature	N

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Model Class	Aggregate Production Model	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
	ASP-SPMW			N			In NEUS, usually 40+ yrs (1963-present)
	Required Inputs						
	B_i	Aggregated Biomass Indices/Time Series; Needs to be combined across spp, usually in absolute but can be in relative terms of an index	D		Biomass	Survey data	Usually Not, but can be
	L_i	Aggregated Landings Time Series; Needs to be combined across spp	D		Biomass per year	Landings data	Usually Not, but can be
	various	Optional Environmental or Ecological Covariates; e.g., AMO, NAO, SST, Predator Biomass	D		Various, may be as anomalies	variable; Oceanographic data, Climatological data, food habits data	Usually Not, but can be
	Required Parameters						
	r	growth rate	S		Biomass per year	derived	N
	K	capacity	S		Biomass	derived	N
	optional β s	covariates	S		variable	derived	N

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Model Class	Aggregate Production							
	Model	ASP-SPMW-Dynamic						
		Required Inputs		N				In NEUS, usually 40+ yrs (1963-present)
		Aggregated Biomass Indices/Time Series; Needs to be combined across spp, usually in absolute but can be in relative terms of an index						
		B_i	D		Biomass	Survey data	Y	
		Aggregated Landings Time Series; Needs to be combined across spp						
		L_i	D		Biomass per year	Landings data	Y	
		Optional Environmental or Ecological Covariates; e.g., AMO, NAO, SST, Predator Biomass						
		various	D		may be as anomalies	variable; Oceanographic data, Climatological data, food habits data	varies	
		Required Parameters						
		r	D		Biomass per year	derived	Y	
		K	D		Biomass	derived	Y	
		optional β s	D		variable	derived	Y	

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Aggregate Production							
Model	Agg v of ASPIC						In NEUS, usually 40+ yrs (1963-present)
	Required Inputs		N				
	B_i	D		Biomass	Survey data	Usually Not, but can be	
	L_i	D		Biomass per year	Landings data	Usually Not, but can be	
	various	D		Various, may be as anomalies	variable; Oceanographic data, Climatological data, food habits data	Usually Not, but can be	
	Required Parameters						
	r	S		Biomass per year	derived	Y	
	K	S		Biomass	derived	Y	
	optional β s	S		variable	derived	N	

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Model Class	Aggregate Production							
	Model	Agg Mod - Overholtz/SAS						
		Required Inputs		N				In NEUS, usually 40+ yrs (1963-present)
		Aggregated Biomass Indices/Time Series; Needs to be combined across spp, usually in absolute but can be in relative terms of an index	D		Biomass	Survey data	Usually Not, but can be	
		B_i						
		Aggregated Landings Time Series; Needs to be combined across spp	D		Biomass per year	Landings data	Usually Not, but can be	
		L_i						
		Optional Environmental or Ecological Covariates; e.g., AMO, NAO, SST, Predator Biomass	D		varies, may be as anomalies	variable; Oceanographic data, Climatological data, food habits data	Usually Not, but can be	
		Required Parameters						
		various						
		r	S		Biomass per year	derived	N	
		growth rate						
		K	S		Biomass	derived	N	
		carrying capacity						
		optional β s	S		variable	derived	N	
		covariates						

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Aggregate Production							
Model	Agg Testing of MS PROD		N				Variable, is a simulator, but typically based on data from 1963-2010; 30 yr runs
	Required Inputs						
	N_i	Biomass or abundance of each group, i.	D	biomass (mt) or numbers per year	Survey data	N	
	S_{ij}	Spatial overlap between each pair of stocks, i and j.	S	unitless	Survey data	N	
	PelDem	Pelagic or demersal designation	S	unitless proportion (usually 1 or 0)	Survey data	N	
	Required Parameters						
	r_i	Growth rate for each stock, i.	S	unitless	Survey data, age data, Assessment models	Y (if stochasticity used)	
	K_i	Carrying capacities for each stock, i.	S	biomass (mt) or numbers	Survey data, Assessment models	N	
	K_s	System carrying capacity	S	biomass (mt) or numbers	Survey data, Assessment models	N	
	α_{ij}	Predation interaction strength between each predator, j, and prey, i.	S	unitless	Food habits data, Literature	N	
	β_{ij}	Between stock competition coefficients of each stock i on each individual stock j.	S	unitless	Food habits data, Literature	N	