Introduction of Software for Data Generation Model

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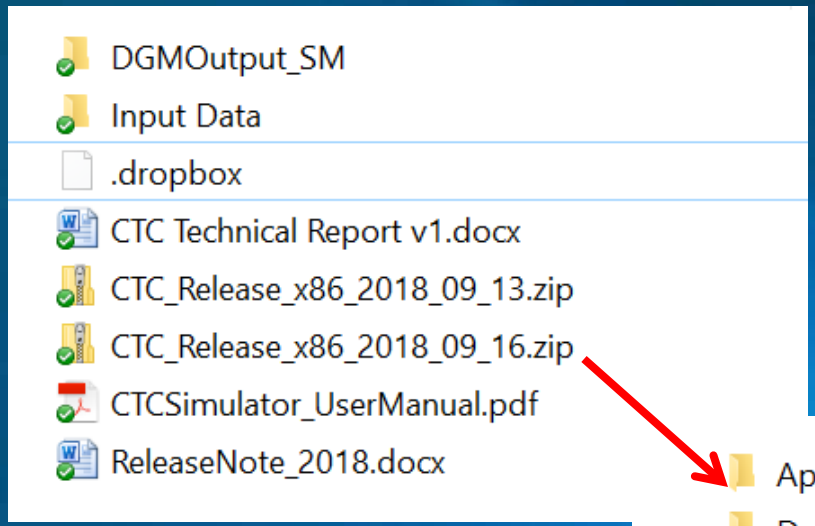
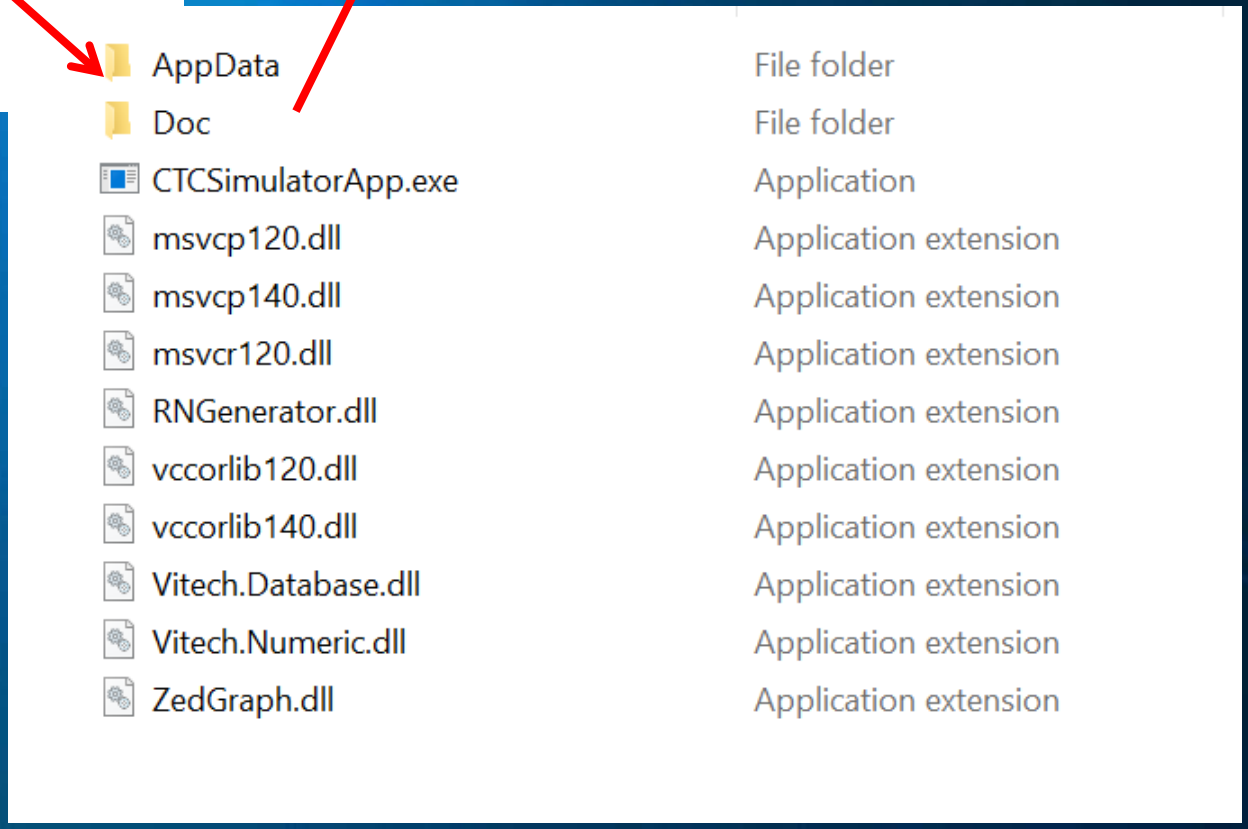
Agenda

- Overview of the DGM Software
  - Release Package
  - Interfaces
  - Procedures of Using Software
  - File Organization
- Input Data Definitions and Structures
- Output Data Structures
- Database
- Discussion on the DGM model

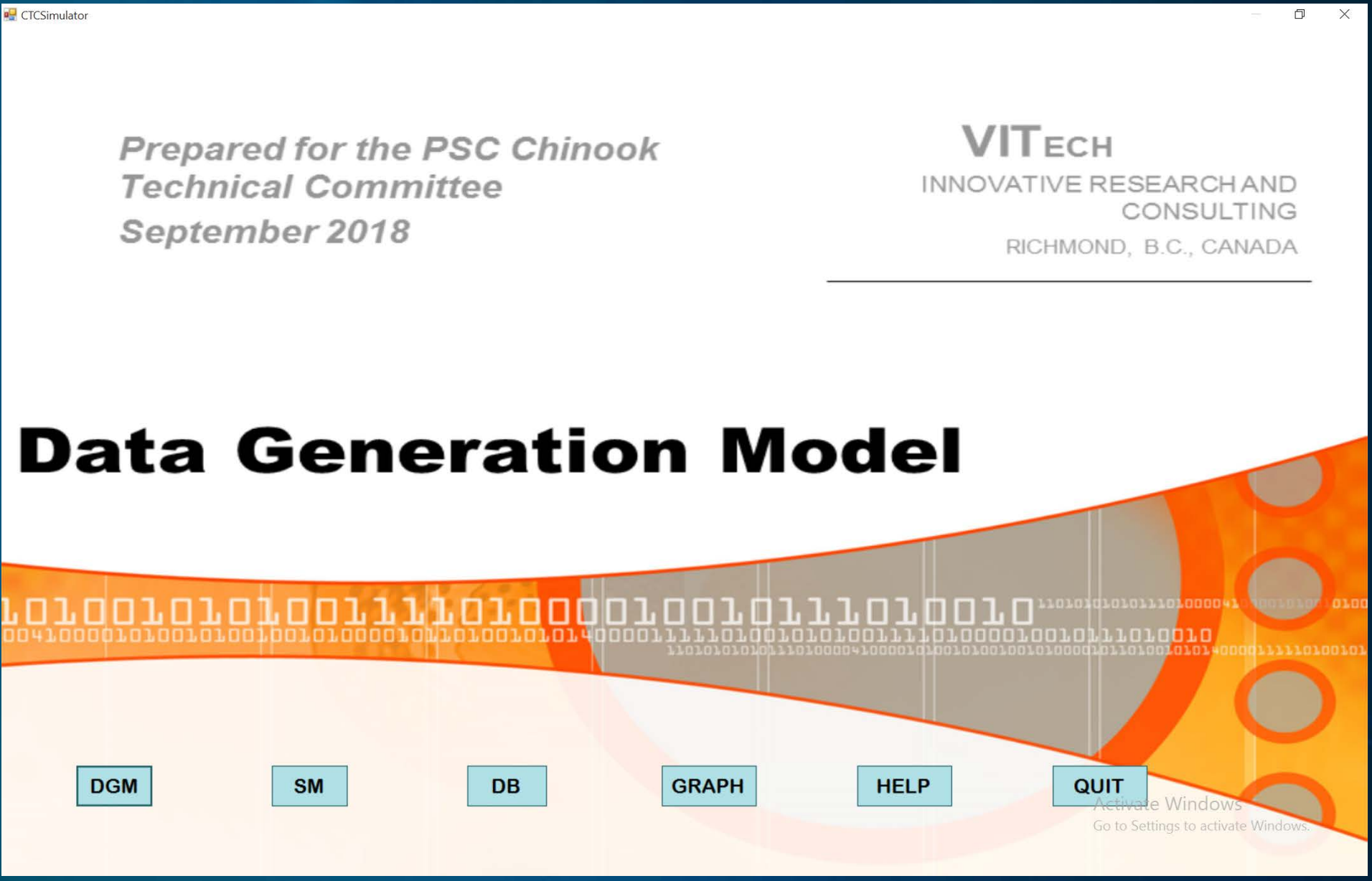
Release Package



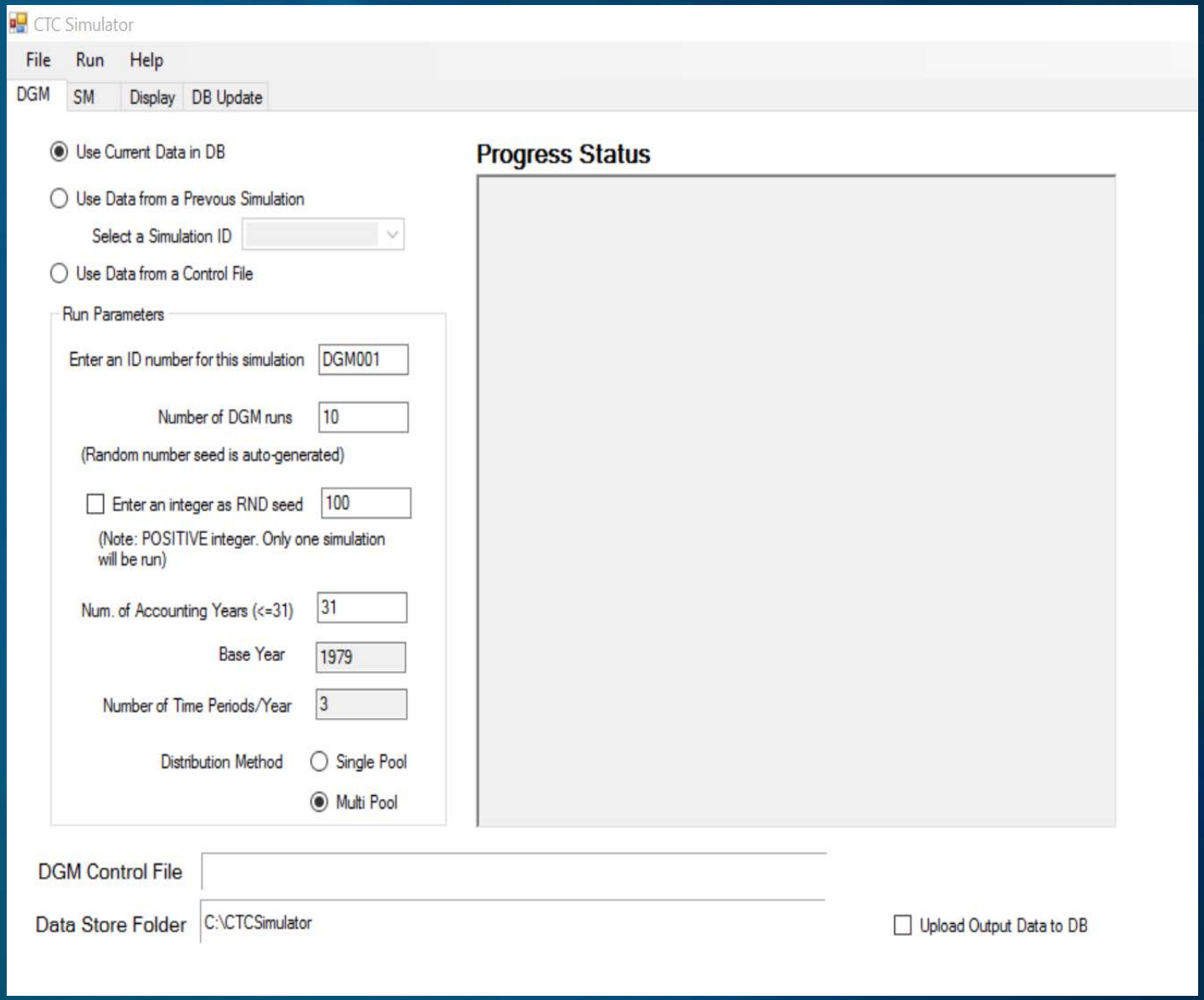
AppData: Access File
Doc: User guide



DGM Startup Interface



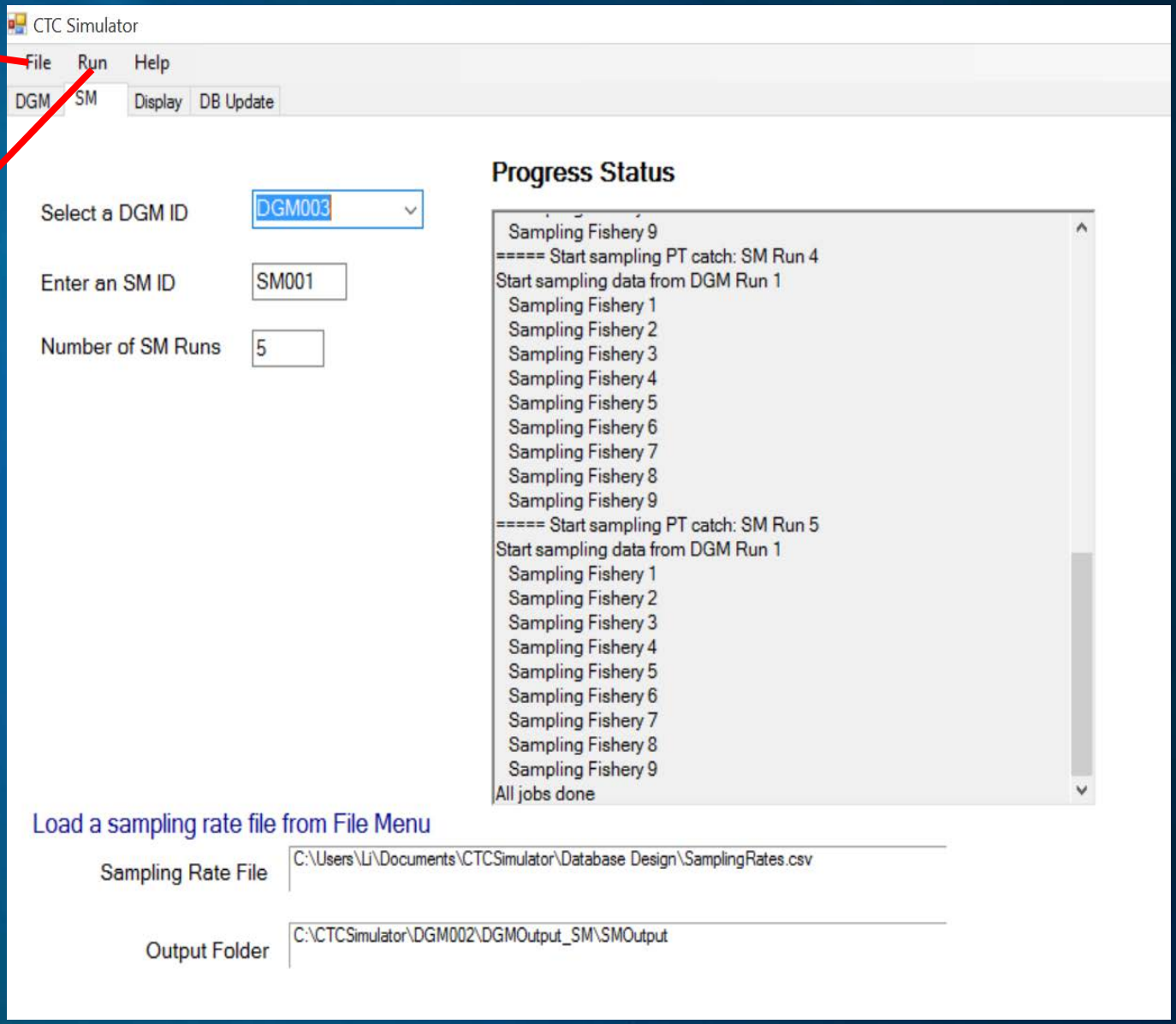
Data Generation Module



Sampling Module

Sampling Rates

Preterminal
Terminal
Escapement

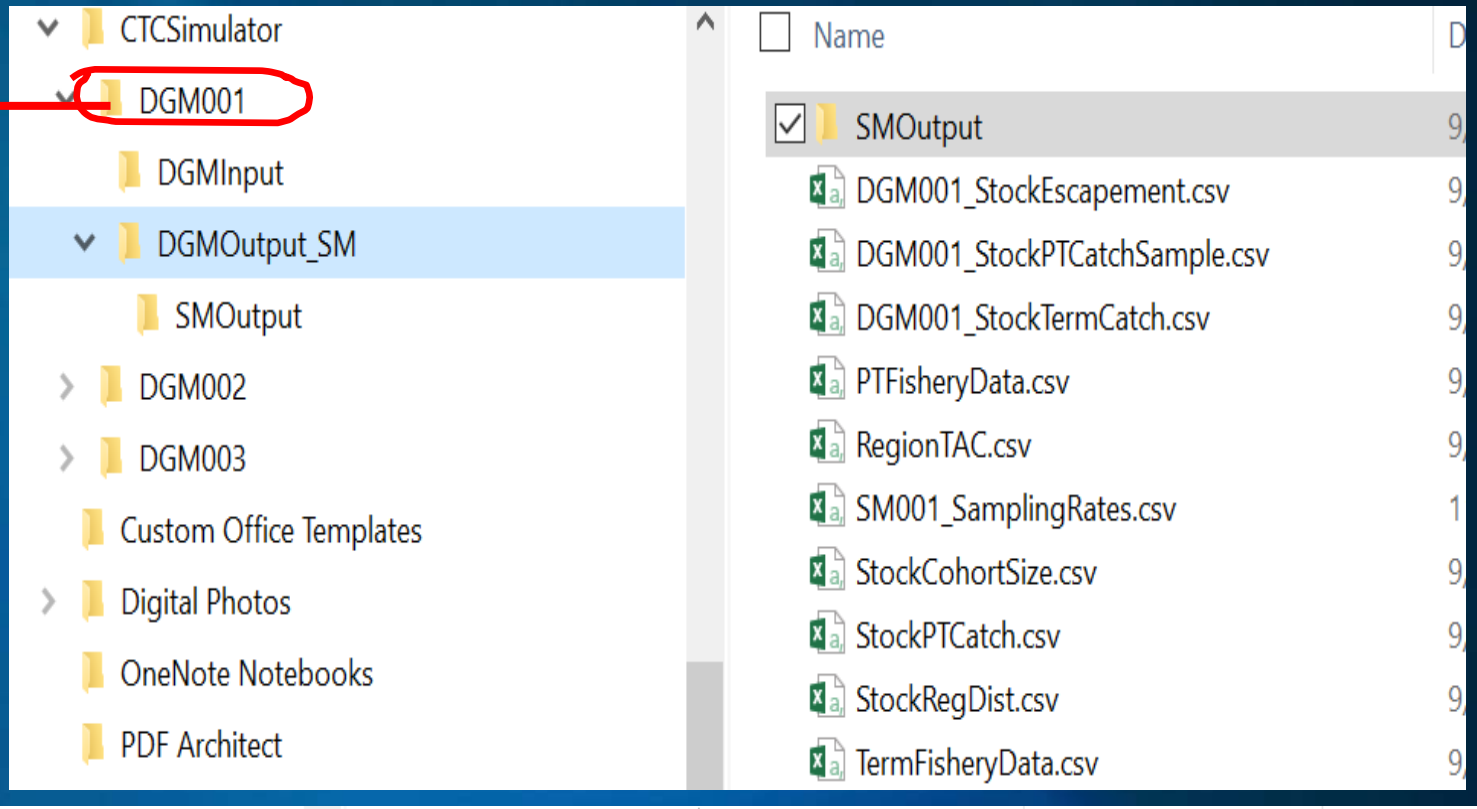


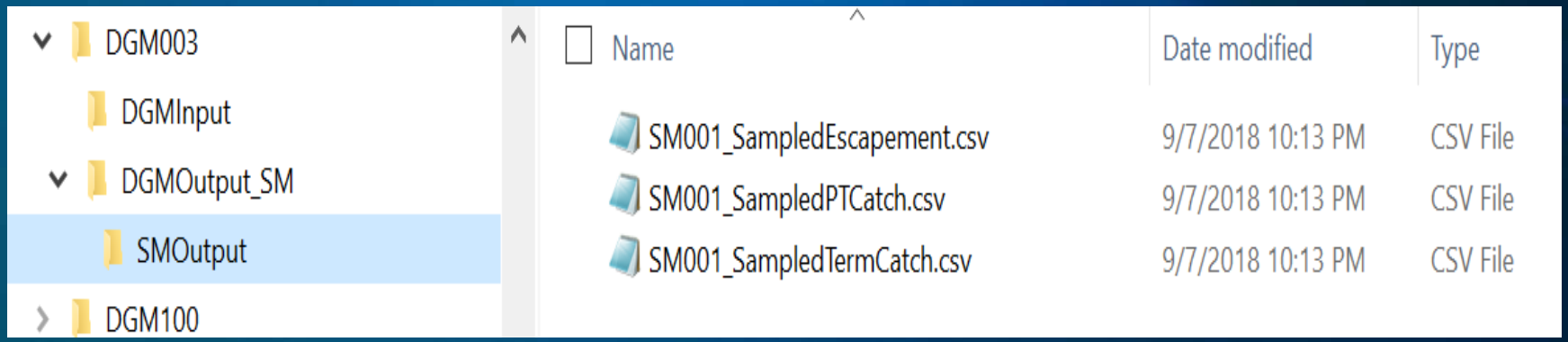
Procedure

- Choose a method to provide input
  - Use a control file
  - Use input files used in a previous run
  - Use current data in DB
- Select a data store folder
- Enter a simulation ID
- Select a method for providing random number seeds
- Select run parameters
- Select a method for stock regional distribution
- Provide a specific lookup table for the conversion of abundance index (AI) to TAC in AABM fisheries (Optional)

File Organization

Project code
Or RunID





Input Data Definitions and Structures

CTCSimInputControl.ctrl: fixed item list and order

CTCStock.csv	Definition of stocks
CohortSize_Age.csv	Cohort size at different ages
CohortRegionDist_MultiPool.csv	Cohort size distribution over regions:multi pool
CohortRegionDist_SinglePool.csv	Cohort size distribution over regions:single pool
GroupSurvival.csv	Survival rates of stocks as a group
Stock_Age_Size.csv	Stock size (length) at different ages
Stock_MatRate.csv	Stock year specific maturation rates
Stock_PrespawnMort.csv	Stock prespawn mortality
CTCFisheries.csv	Definition of fisheries
Fishery_Dist_Period.csv	Fish allocation over time periods
Fishery_HrScalar.csv	Fishery specific harvest rate scale
Fishery_MarkedRetention.csv	Fishery specific marked retention data
Fishery_Mortality.csv	Fishery specif mortality rates
Fishery_SizeLimit.csv	Fishery specific size limit
Region_Sector_Alloc.csv	Regional sector allocation
BasePeriod_ER.csv	Base period exploitation rates
Stock_TermHR.csv	Stock terminal harvest rates
Stock_TermHRScalar.csv	Stock terminal harvest rate scalars
Stock_TermMortRetention.csv	Stock terminal mortalities and retention data

Basic Tables

- CTCStock.csv: Defines stocks to simulate. Unique Stock ID. Basic properties provided in this table. Other properties are linked to Stock ID.
  - *Stock ID, Description, Type, Assoc Stock, Ocean/Stream, Maturation Period, Survival Group ID, Corr Coeff, Ricker A, SD Ricker A, Ricker B, SD Ricker B*
- CTCFisheries.csv: Defines fisheries to simulate. Unique Fishery ID. Basic properties provided in this table. Other properties are linked to Fishery ID.
  - *Fishery ID, Name, Region, Sector, Type, IsAIDriver*

Some Important tables

- CohortSize_Age.csv: provides cohort size of a stock at different ages in the base year (1979)
  - Stock ID, Age, Abundance, Unmarked(U), Unmarked+CWT (U+), Marked(M), Marked+CWT(M+)
- Fishery_MarkedRetention.csv: provides preterminal fishery specific marked retention data.
  - *Fishery ID, Name, Year, …, Max_Unmarked Fish Allowed, IsMSF*
  - *MaxUF = 0 and IsMSF=1 → Straight MSF*
- Stock_TermMortRetention.csv: provides a number of mortality and retention data in terminals.
  - *StockID,Year,FisheryID,Sector, …, Max_Unmarked Fish Allowed, IsMSF*
  - *MaxUF = 0 and IsMSF=1 → Straight MSF*

DGM Output Data →SM Input

- *xxx_StockPTCatch:* contains preterminal catch and mortality data
  - RunID, StockID, Year, Period, Fishery, Age, C_U, C_U+, C_M, C_M+, DM_U, DM_U+, DM_M, DM_M+, RM_U, RM_U+, RM_M, RM_M+
- *xxx_StockTermCatch:* contains terminal catch and mortality data
  - RunID, StockID, Year, Age, C_U, C_U+, C_M, C_M+, DM_U, DM_U+, DM_M, DM_M+, RM_U, RM_U+, RM_M, RM_M+
- *xxx_Escapement:* contains escapement data, which is counts of fish of a stock that escape during a given period.
  - RunID, StockID, Year, Age, U, U+, M, M+

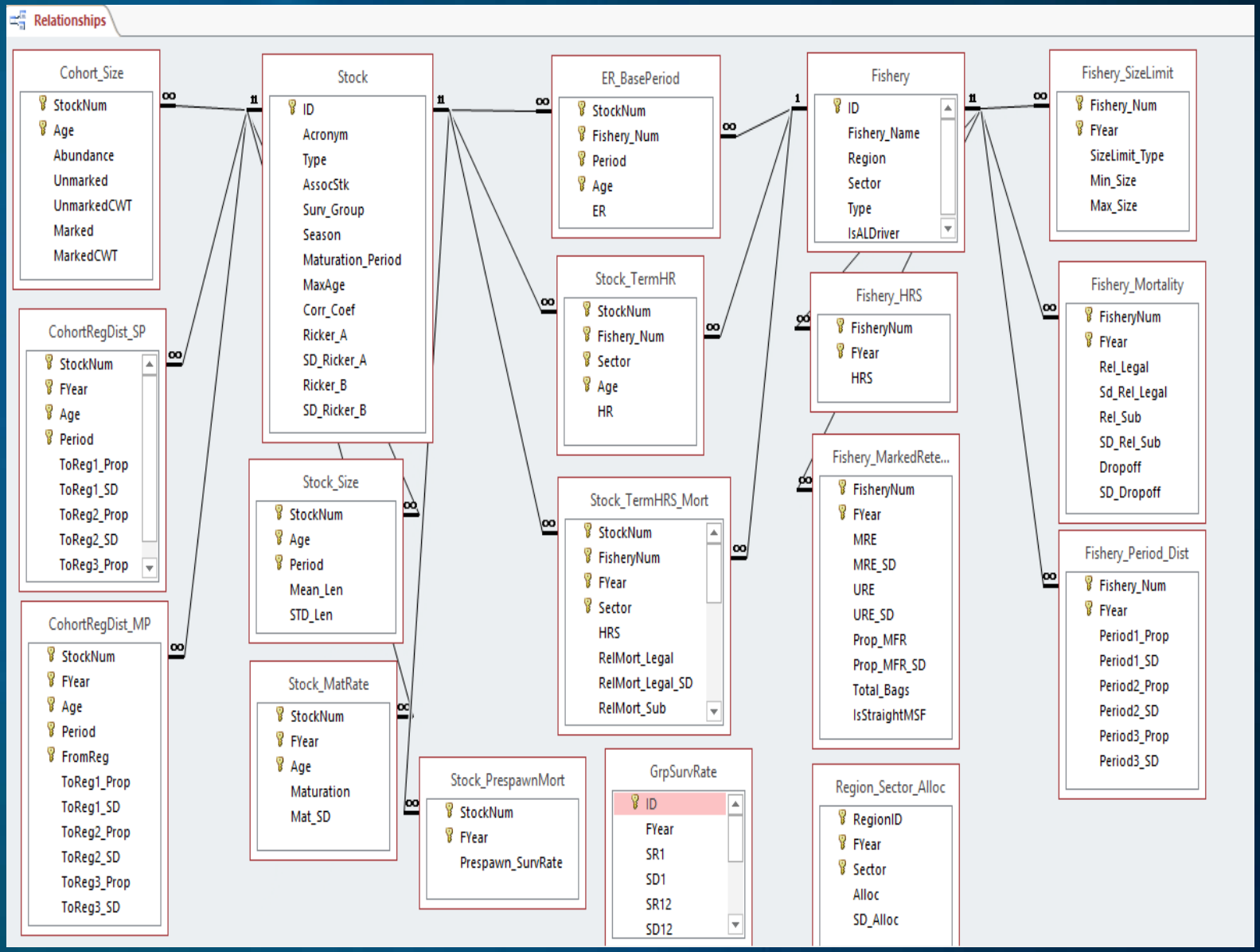
SM Output

- *xxx_SampledPTCatch.csv*
  - SMRunID, DGMRunID, Year,Period, FisheryID, StockID, Age, SampledU, TotalU, SR_U, SampledU+, TotalU+, SR_U+, SampledM, TotalM, SR_M, SampledM+, TotalM+, SR_M+
- *xxx_SampledTermCatch.csv*
  - SMRunID, DGMRunID, Year, FisheryID, StockID, Age, SampledU, TotalU, SR_U, SampledU+, TotalU+, SR_U+, SampledM, TotalM, SR_M, SampledM+, TotalM+, SR_M+
- *xxx_SampledEscapement.csv*
  - SMRunID, DGMRunID, Year, StockID, Age, SampledU, TotalU, SR_U, SampledU+, TotalU+, SR_U+, SampledM, TotalM, SR_M, SampledM+, TotalM+, SR_M+

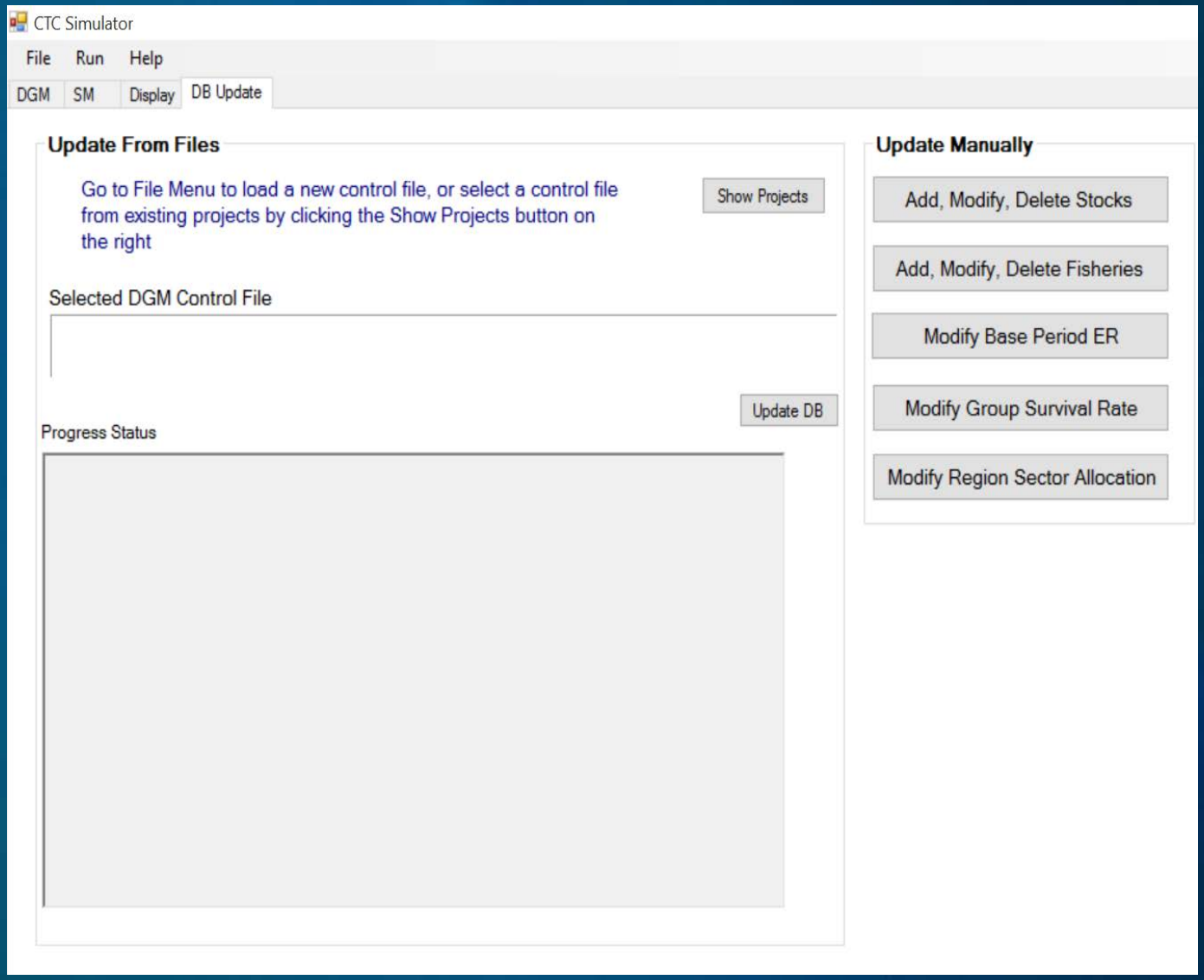
Database

- Populate tables via control file (fast data entry if empty tables are empty)
- Impose data integrity check (e.g. unique IDs, duplicates)
- Add new stocks and fisheries, or delete old ones more conveniently (otherwise the user will have to go through all the data files and add/delete correctly)
- Create or edit individual items in existing tables

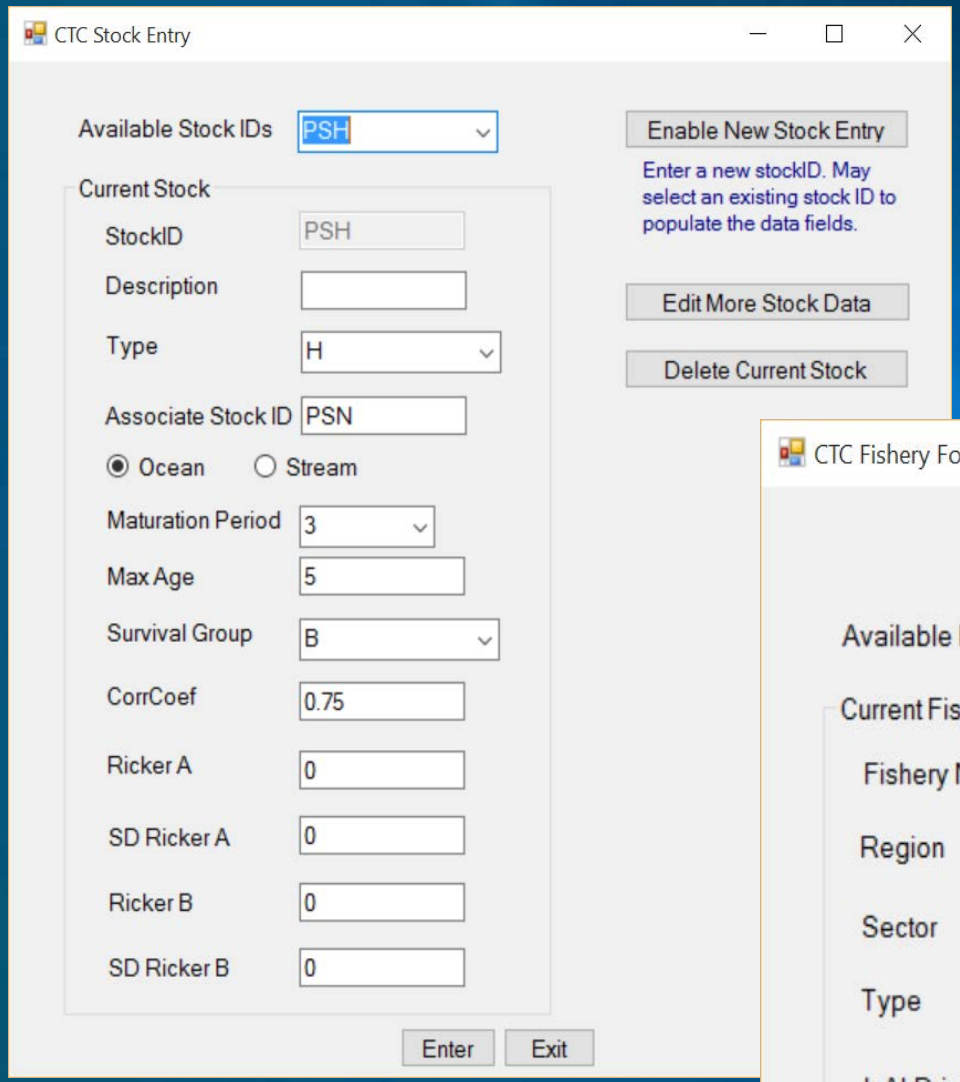
Database Schematic View

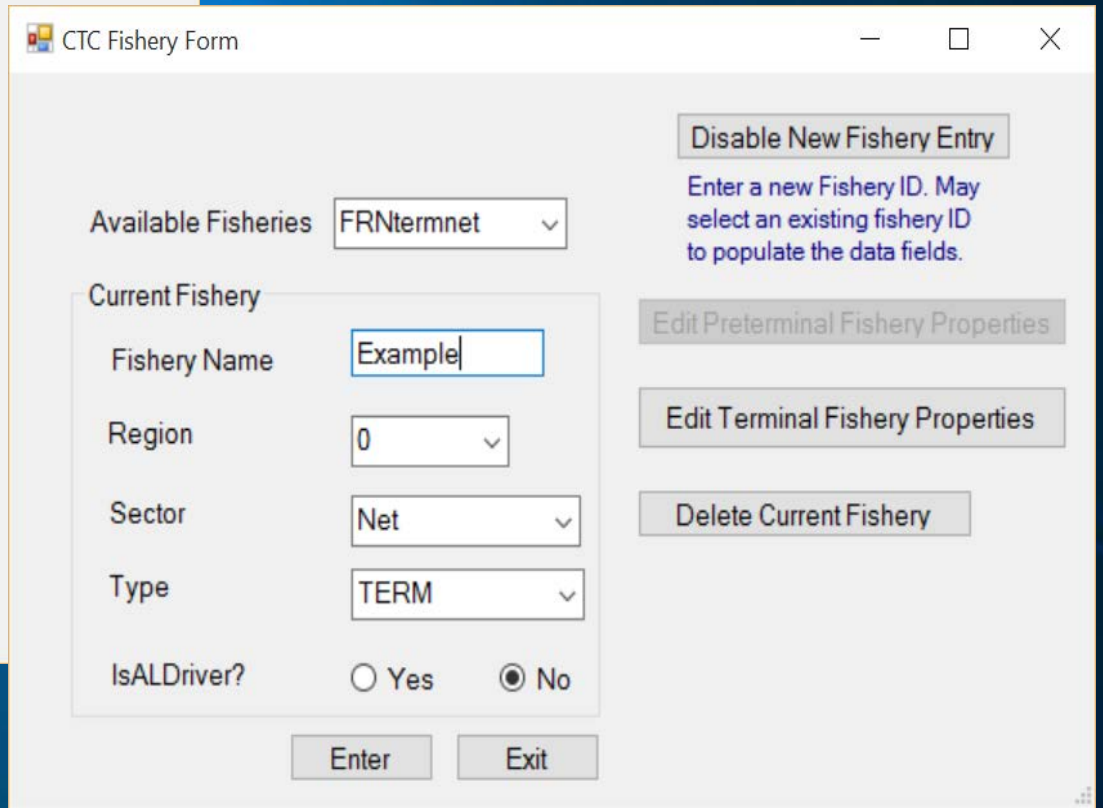


Database Update Interface

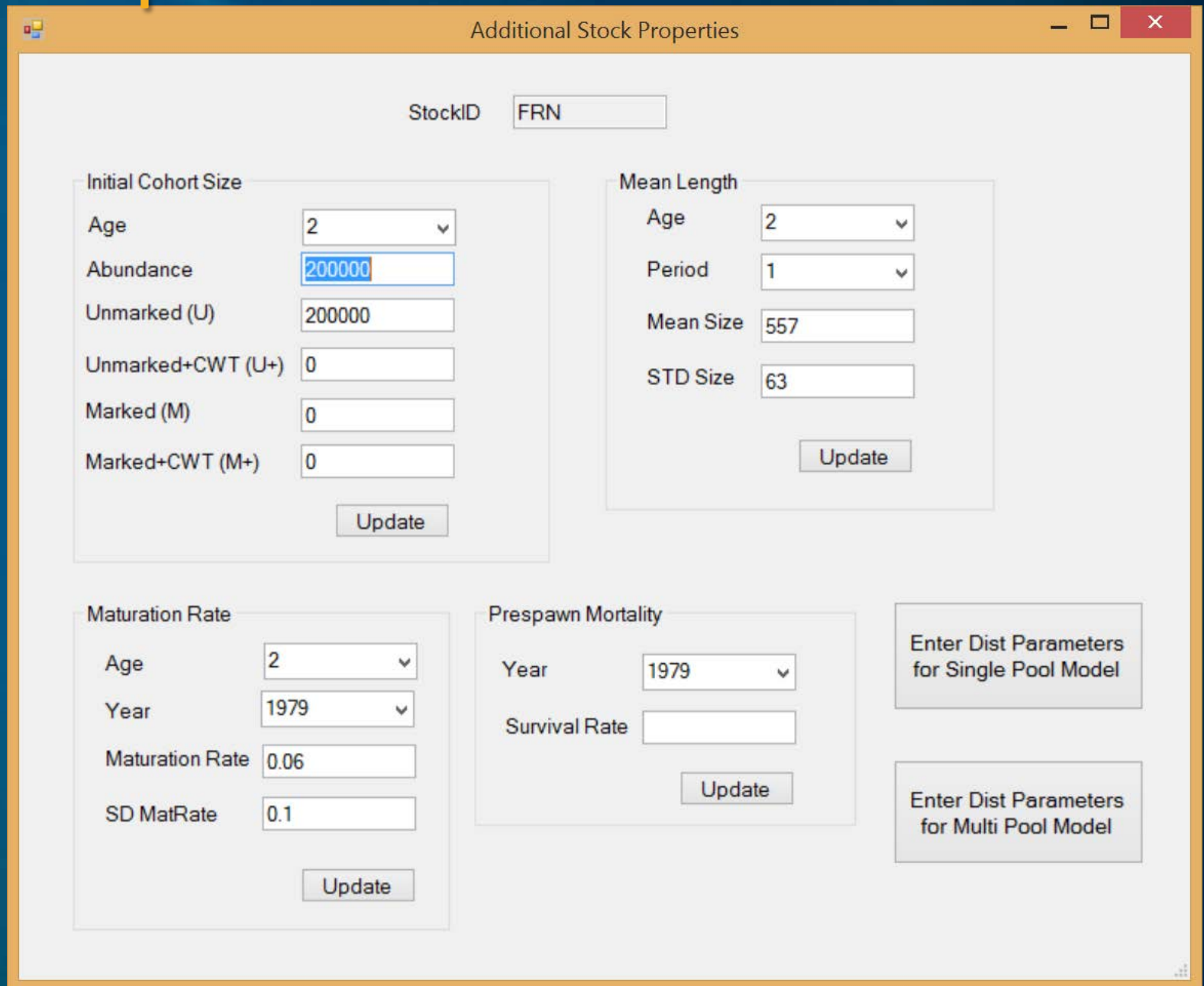


Stock and Fishery Table

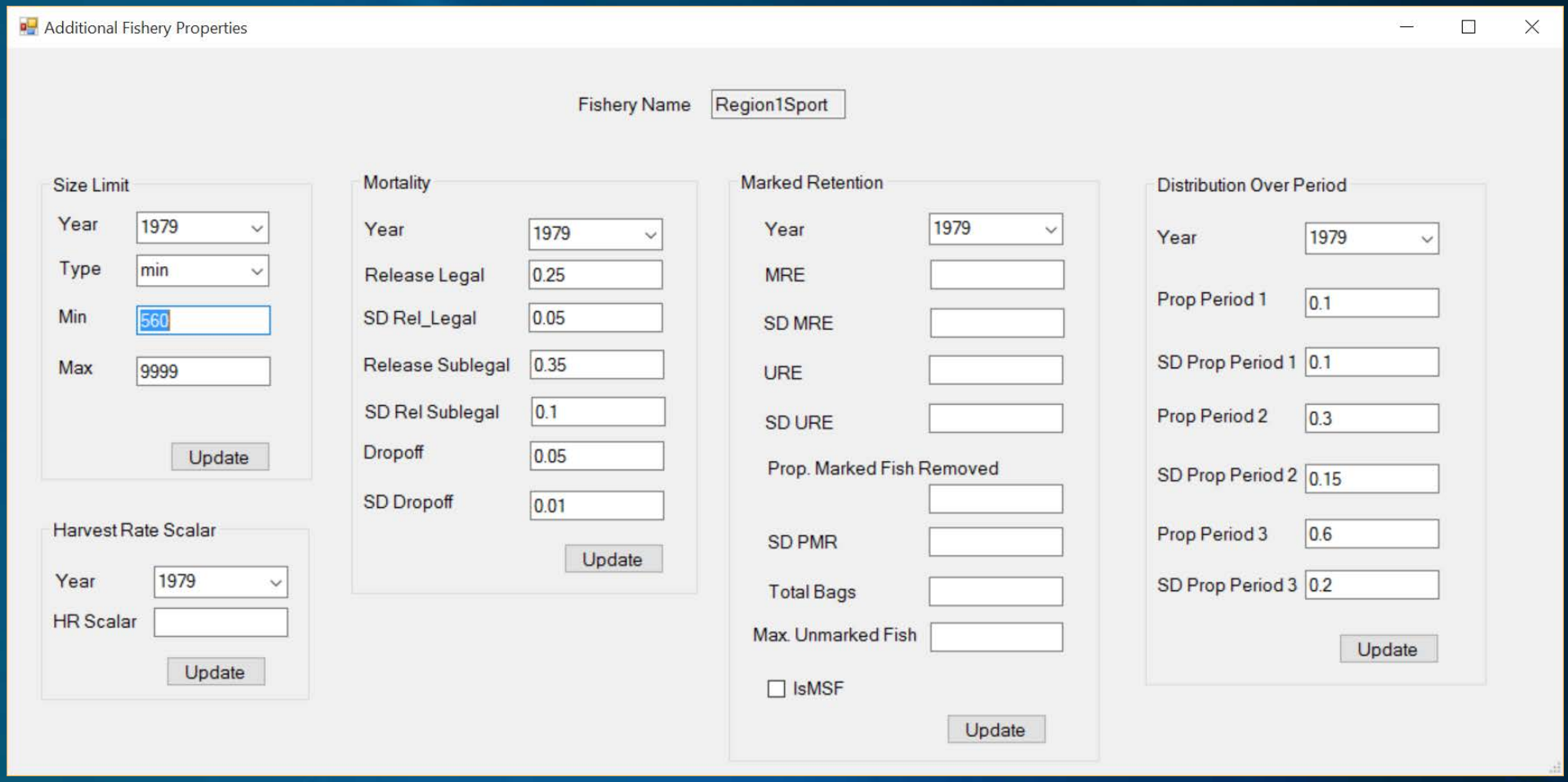




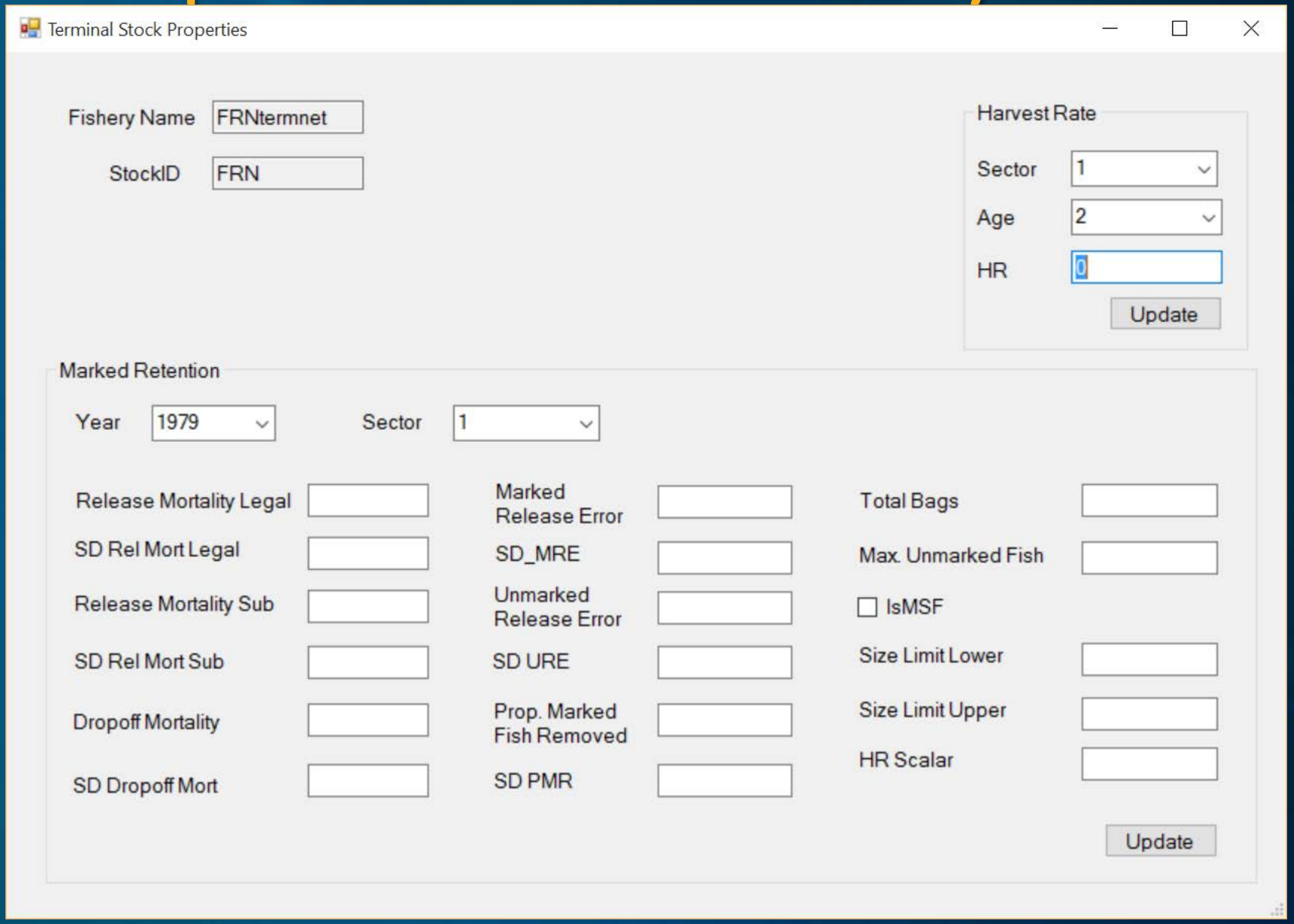
Example of Stock



Example of Preterminal Fishery



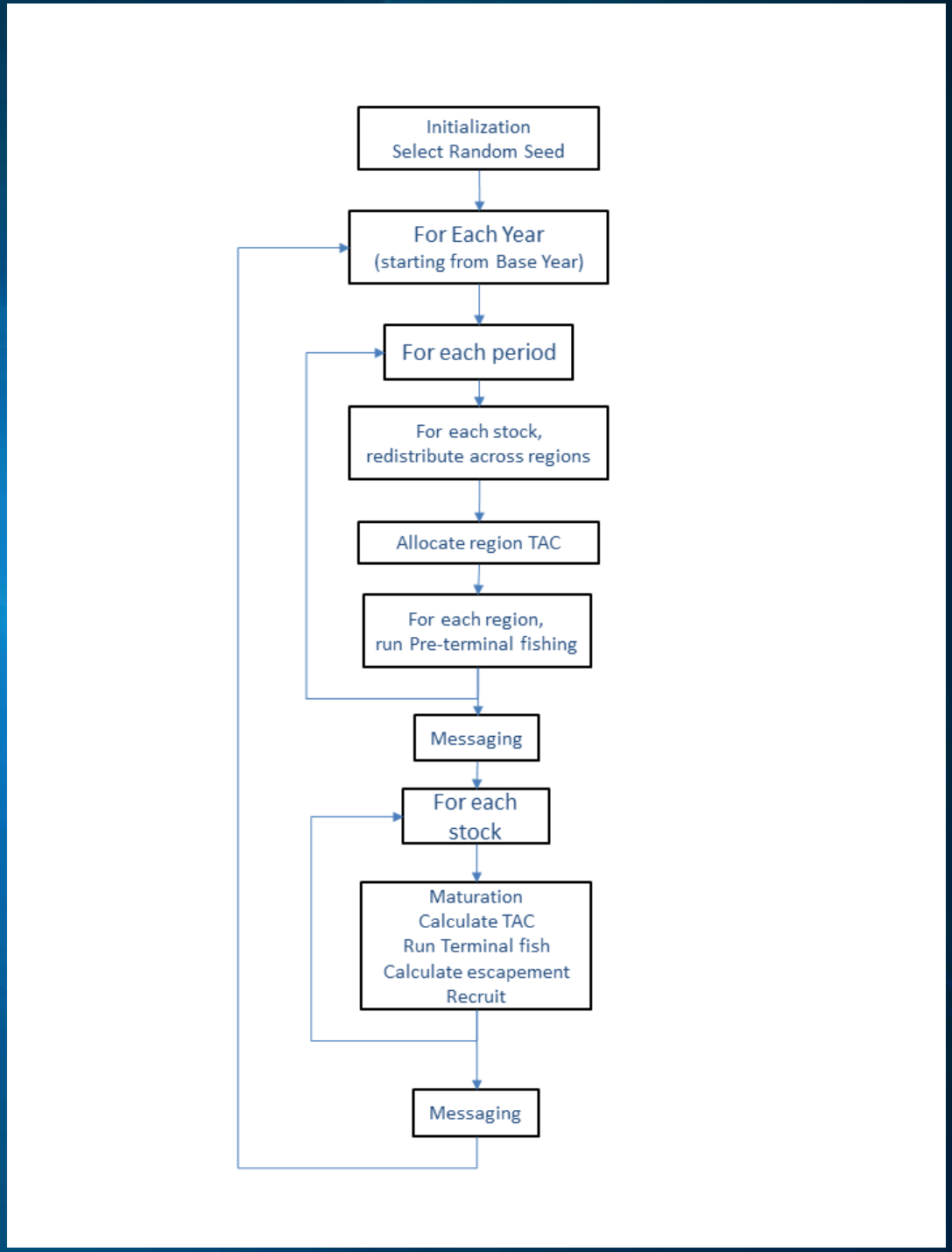
Example of Terminal Fishery



DGM Model

Discussion

DGM Flow Chart



Some details worth mentioning

- Calculation of preterminal TAC
  - AABM: Use abundance index (AI) of driver fishery in a region to obtain regional TAC in a lookup table (or a model hard-coded in the program)
  - TAC of each individual fishery in an AABM region is then determined by distributing the total regional TAC to individual sectors, according to the parameters specified in Fishery_Dist_Period.csv and Region_Sector_Alloc.csv
  - ISBM: Based on Harvest Rate Scalar
- Calculation of the TAC for MSF:
  - defined as the abundance of unmarked fish available to fishery times a parameter called the Proportion of unmarked fish removed.
  - MSF continues while the unmarked mortalities are less than the MSF TAC or the fishery TAC, whichever is less.

Next Steps?