

US EPA ARCHIVE DOCUMENT

### 3.0 Specifications for the Distribution Statistics Processor

The DSP randomly samples from statistical distributions representing measurement and sampling error related to the statistics of parameters required by the modules in the MMSP (e.g., distribution, mean, standard deviation, and range). The DSP receives input from the Regional and national environmental setting distribution statistics databases. Output from the DSP populates the statistical portion of the regional statistics and national statistics databases.

#### 3.1 Read and Write Requirements of the Distribution Statistics Processor

The DSP is expected to read the header SSF to know which site and realization is currently being executed. Like all processors and modules, any errors that occur in the DSP are expected to be written to the GRF directory. The variable definitions for the header SSF can be found in Appendix A, Table A.1.1. The DSP is required to read and write in the following manner:

Call Arguments	Description
SSF_Dir	Call for Site Simulation Files Directory
GRF_Dir	Call for Global Results Files Directory
Header File Name	Header file contains all information needed to run entire simulation

<b>Read expectations</b>	National and Regional Distribution Statistics Databases (format discussed in Section 3.2)
<b>Write expectations</b>	National and Regional Statistics Databases (format discussed in Section 3.2)

#### 3.2 National and Regional Environmental Setting Distribution Statistics Database Formats

This section describes the file formats for the different databases used as input to the DSP and files created by the DSP. The national environmental setting distribution statistics database will be named NDistStat.mdb. The regional version of that same file will be RDistStat.mdb. The NDistStat.mdb and RDistStat.mdb file format will be a Microsoft® Access database with the four tables listed below:

- 1) Variable distribution data (see Table 3.1) and example of variable distribution data (see Table 3.2)
- 2) Cross-Correlation Data (see Table 3.3) and example of cross-correlation data (see Table 3.4)

- 3) User-defined distribution data (see Table 3.5) and example of User-Defined Distribution Data (see Table 3.6)
- 4) Reference data (see Table 3.7) and example of reference data (see Table 3.8).

**Table 3.1** Variable Distribution Data for the Regional and National Environmental Setting Statistics Databases

Field Name	Description	Type	Number of Characters
Setting_ID	text string that is a unique identifier for a variable	Text	20
Data_Group_Name	text string that defines which data group this variable is in	Text	20
Variable_Name	text string that defines this variable's name	Text	20
Units	units of variable	Text	20
Index_1	define the indices for this variable	Number (Integer)	
Index_2	define the indices for this variable	Number (Integer)	
Index_3	define the indices for this variable	Number (Integer)	
Index_4	define the indices for this variable	Number (Integer)	
Index_5	define the indices for this variable	Number (Integer)	
Index_6	define the indices for this variable	Number (Integer)	
Data_Type	type of information this variable stores. String, Logical, Real, and Integer are the possibilities	Text	10
Reference_Index	defines the reference number for this variable	Text	20
Minimum	minimum value for this variable	Number (Double)	
Maximum	maximum value for this variable	Number (Double)	
Distribution_Type	distribution type for this variable. Constant, Uniform, Normal, Log Uniform, Log Normal, User Defined, etc. are the possibilities	Text	12
CTD_Distribution_Type	Distribution type of the Central Tendency Distribution (CTD); Constant, Uniform, Normal, Log Uniform, Log Normal, User Defined, etc. are the possibilities	Text	10
CTD_Central_Tendency	CTD's Central Tendency value. Mean for normal distribution for example. It is also the value that will be used in a constant distribution.	Number (Double)	
CTD_Variance	CTD's Variance parameter. Standard Deviation for normal distribution for example.	Number (Double)	
CTD_Minimum	CTD's minimum value	Number (Double)	

Field Name	Description	Type	Number of Characters
CTD_Maximum	CTD's maximum value	Number (Double)	
CTD_User_Def_Index	If the distribution type is user defined this value defines the index of the user defined distribution values in the User Defined Distribution Data table.	Text	20
VD_Distribution_Type	Variance Distribution; Constant, Uniform, Normal, Log Uniform, Log Normal, User Defined, etc. are the possibilities	Text	12
VD_Central_Tendency	VD's Central Tendency value. Mean for normal distribution for example. It is also the value that will be used in a constant distribution.	Number (Double)	
VD_Variance	VD's Variance parameter. Standard Deviation for normal distribution for example.	Number (Double)	
VD_Minimum	VD minimum value	Number (Double)	
VD_Maximum	VD maximum value	Number (Double)	
VD_User_Def_Index	If the distribution type is user defined this value defines the index of the user defined distribution values in the User Defined Distribution Data table.	Text	20
Cross_Correlation	Cross correlation between the CTD and VD	Number (Single)	

**Table 3.2** Example of Variable Distribution Data for the Regional and National Environmental Setting Statistics Databases

Field Name	Record 1	Record 2	Record 3	Record 4	Record 5	Record 6
Setting_ID	EPA_1	EPA_1	EPA_1	EPA_1	EPA_1	EPA_1
Data_Group_Name	SRC_1	SRC_1	SRC_1	SRC_1	SRC_1	SRC_1
Variable_Name	sw_var46	sw_var46	sw_var46	sw_var46	ATArea	veg
Units	cm/yr	cm/yr	cm/yr	cm/yr	cm2	fraction
Index_1	1	1	1	1	0	0
Index_2	1	2	3	4	0	0
Index_3	0	0	0	0	0	0
Index_4	0	0	0	0	0	0
Index_5	0	0	0	0	0	0
Index_6	0	0	0	0	0	0
Data_Type	float	float	float	float	float	float
Reference_Index	Example1	Example1	Example1	Example1	Example1	Example1
Minimum	20	20	40	40	30	10
Maximum	80	60	60	80	40	80
Distribution_Type	Normal	Normal	Normal	Normal	User Defined	Normal
CTD_Distribution_Type	Normal	Normal	Normal	Normal	Normal	Normal
CTD Central_Tendency	15	15	15	15	0	0.5

Field Name	Record 1	Record 2	Record 3	Record 4	Record 5	Record 6
CTD_Variance	5	5	5	5	0	0.15
CTD_Minimum	0	0	0	0	25	0
CTD_Maximum	30	30	30	30	45	1
CTD_User_Def_Index					AT Area	
VD_Distribution_Type	Normal	Normal	Normal	Normal	User Defined	Normal
VD_Central_Tendency	15	10	0	20	10	0.5
VD_Variance	5	5	5	10	0	0.5
VD_Minimum	0	0	0	25	10	5
VD_Maximum	30	30	20	40	50	20
VD_User_Def_Index					AT Area	
Cross_Correlation	1	-1	1	0	1	1

**Table 3.3** Cross-Correlation Data for the Regional and National Environmental Setting Statistics Databases

Field Name	Type	Number of Characters
V1_Setting_ID	Text	20
V1_Data_Group_Name	Text	20
V1_Variable_Name	Text	20
Units	Text	20
V1_Index_1	Number (Integer)	
V1_Index_2	Number (Integer)	
V1_Index_3	Number (Integer)	
V1_Index_4	Number (Integer)	
V1_Index_5	Number (Integer)	
V1_Index_6	Number (Integer)	
V2_Setting_ID	Text	20
V2_Data_Group_Name	Text	20
V2_Variable_Name	Text	20
V2_Index_1	Number (Integer)	
V2_Index_2	Number (Integer)	
V2_Index_3	Number (Integer)	
V2_Index_4	Number (Integer)	
V2_Index_5	Number (Integer)	

Field Name	Type	Number of Characters
V2_Index_6	Number (Integer)	
Cross_Correlation	Number (Single)	

**Table 3.4.** Example of Cross-Correlation Data for the Regional and National Environmental Setting Statistics Databases

Field Name	Record 1	Record 2	Record 3	Record 4
V1_Setting_ID	EPA_1	EPA_1	EPA_1	EPA_1
V1_Data_Group_Name	SRC_1	SRC_1	SRC_1	SRC_1
V1_Variable_Name	sw_var46	sw_var46	sw_var46	sw_var46
Units	cm/yr	cm/yr	cm/yr	cm/yr
V1_Index_1	1	1	1	1
V1_Index_2	1	2	3	4
V1_Index_3	0	0	0	0
V1_Index_4	0	0	0	0
V1_Index_5	0	0	0	0
V1_Index_6	0	0	0	0
V2_Setting_ID	EPA_1	EPA_1	EPA_1	EPA_1
V2_Data_Group_Name	SRC_1	SRC_1	SRC_1	SRC_1
V2_Variable_Name	veg	veg	veg	veg
V2_Index_1	0	0	0	0
V2_Index_2	0	0	0	0
V2_Index_3	0	0	0	0
V2_Index_4	0	0	0	0
V2_Index_5	0	0	0	0
V2_Index_6	0	0	0	0
Cross_Correlation	0.85	0.85	0.85	0.85

**Table 3.5.** User-Defined Distribution Data for the Regional and National Environmental Setting Statistics Databases

Field Name	Type	Number of Characters
User Defined Dist. Index	Text	20
Value	Number (Double)	
Cumulative Probability	Number (Double)	

**Table 3.6** Example of User-Defined Distribution Data for the Regional and National Environmental Setting Statistics Databases

Field Name	Record 1	Record 2	Record 3	Record 4
User Defined Dist. Index	ATArea	ATArea	ATArea	ATArea
Value	25	35	40	45
CumulativeProbability	10	60	90	100

**Table 3.7** Reference Data for the Regional and National Environmental Setting Statistics Databases

Field Name	Type	Number of Characters
Reference Index	Text	20
Reference Description	Memo	Unlimited

**Table 3.8** Example Reference Data for the Regional and National Environmental Setting Statistics Databases

Field Name	Record 1
Reference Index	Example 1
Reference Description	This is a reference for example purposes only!