

# **GeoSAMS GUI**

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Version 0.1



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# 1 GeoSAMS GUI

This is the main program for the GeoSAMS GUI

The GUI has 7 tabs

1. **Math Setup** : This frame allows the user to modify the Matlab/Octave startup files.
2. **Main** : Data concerning simulation duration, configuration files in use, and recruitment period
3. **Growth** : Define parameters to compute fishing mortality
4. **Special Access** : Files used to define special areas for fishing management
5. **Fishing Mort in Special Access** : This frame in conjunction with the Special Access Frame is used to define fishing mortalities within a defined area for a specified year. If a location falls within the defined area given by the area definitions in Special Access Frame and assigned the area number.
6. **Sort By Area** : Parameters that are used to sort output data and associate with areas of interest
7. **Sort By Region** : Parameters that are used to sort output data and associate with zones defined by shapefiles

The program is started by entering the following command in the root directory of the workspace  
`$ python .\PythonScripts\GUI\GeoSAM\GeoSams.py [10 8]`

Where the last two number are optional and used to set limits on:

- The maximum number of areas of interest that can be defined.
- The maximum number of nodes used to specify each area of interest.

When commanded without these values the GUI defaults to 50 and 8. These values can be viewed by clicking the **SHOW Args** Button

## 1.1 SHOW Args

As already mention this button is used to show the setup parameters that the GUI is using for maximum number of areas, nodes, and years

## 1.2 START Sim

This button will start both the GeoSAMS sim and if successful continue with the UK interpolation. It does so by first saving the data contained in the other tabs of the GUI to configuration files specified on this page. It will overwrite the files named if they already exist.

NOTE: The file names listed are part of the package installed when downloaded from GitHub. The user may change these names to preserve the original files. Or reinstall from GitHub to restore the original data.

## 1.3 SAVE ALL Configs

This is the first step in **START Sim** . This button will save all of the configuration files using the names given.

## 1.4 Year in file names

GUI specifies 2022 to 2025

- X\_Y\_BIOM\_2022\_DN Initial state as of June 1, 2022 @ 00:00, i.e. May 31, 2022 @ 24:00
- X\_Y\_BIOM\_2023\_DN Growth state as of May 31, 2023 @ 24:00, results for 1st year growth
- X\_Y\_BIOM\_2024\_DN Growth state as of May 31, 2024 @ 24:00, results for 2nd year growth

- X\_Y\_BIOM\_2025\_DN Growth state as of May 31, 2025 @ 24:00, results for 3rd year growth
- X\_Y\_BIOM\_2026\_DN Growth state as of May 31, 2026 @ 24:00, results for 4th year growth

## 2 Math Setup Frame

Matlab should not need any modification as these are the installed directories.

The user should not need to run any Matlab scripts as these are called from the GUI.

Octave on the other hand does require some setup. The user will need to install the desired packages from <https://gnu-octave.github.io/packages/>

- io
- geometry
- mapping
- statistics

### 2.1 Radio Button

The user then needs to modify `.octaverc` to point to where these are installed. Click the Octave radio button and edit the text box to reflect your environment. Then click Write Startup File.

### 2.2 Write Startup File

When ready, click Write Startup File to save the content to the appropriate startup file

- `startup.m`
- `.octaverc`

Note 1: on a Unix/MacOS platform it is assumed that Matlab is not installed. The script `Unpack.sh` renames `startup.m` to `startup.xxx` so it is not taken for `.octaverc`

Note 2: If data initialization files have not yet been created, `Unpack.sh` is called to do so.

## 3 Set Fishing Mortality in Special Access Areas

Assists the user in defining areas of interest to assess accumulated parameters located in these areas of interest.

### 3.1 Number Defined

The number of defined areas as determined by the user. This is limited by Max Areas of Interest. See SHOW Args button for current values.

The Number Defined is limited by default to 25. See SHOW Args for current values. The user can modify this on the command line:

```
.\\PythonScripts\\GUI\\GeoSAM\\GeoSams.py Areas Nodes
```

Default:

```
.\\PythonScripts\\GUI\\GeoSAM\\GeoSams.py 25 8
```

### 3.2 Load and Save Fishing Mortality Files

The name of the file used to hold this information. The user can load the default file 'FishingMortality.csv' or save their own configuration.

If this feature is not desired then enter NONE in the window

Use Load Fishing Mort File to load a predefined set of data

Use Save Fishing Mort File to save the currently displayed setting

### 3.3 Area SubFrames

Comment: Optional. Enter a comment to describe the area being specified.

#### 3.3.1 Year Definitions

The year for which Area N is valid

#### 3.3.2 Corners, or Fields of Defined Mortalities by Area

##### 3.3.2.1 Number of Corners

Corners: Specifically, the number of Fields for the year given. This is limited by Max Nodes in Area. See SHOW Args for current values. This can be changed on the command line. See above

##### 3.3.2.2 Field Identifier by Special Area and Mortality

These are the area numbers as determined in Special Access Frame. Enter the area number and its Mortality.

## 4 Growth Frame

Allows the user to modify parameters that are used to define mortality computations.

### 4.1 Mortality

#### 4.1.1 Fishing Mortality

This is the default fishing mortality in lieu of any other definition

#### 4.1.2 Alpha Mortality

So for open areas, an overall fishing mortality  $F_{avg}$  would be specified and then  $F$  at each location would be computed so that:

1. The weighted average (by exploitable numbers),  $F$ , over all locations is equal to  $F_{avg}$  and
  2.  $F$  at each location is proportional to  $LPUE^{\alpha_{mort}}$ .
- This would also apply to special access areas, but each one would have their own specified  $F$ , and the average would only be for those points within that access area.

$$f_{avg} = \frac{\sum(\vec{scallop}_{num} \cdot F_{mort_{open}})}{\sum(\vec{scallop}_{num})}$$

#### 4.1.3 Adult Mortality

Table 1 Mortality

	Adult	Length <sub>0</sub>
MA	0.25	65.0
GB	0.2	70.0

#### 4.1.4 Computing Alpha

Alpha is based on the lengths of the shell normalized by length<sub>0</sub>

$$\vec{\alpha} = 1 - \frac{1}{1 + \exp\left(-(\vec{length}_{shell} - length_0)/10\right)}$$

#### 4.1.5 Computing Natural Mortality

Then natural mortality is computed from juvenile natural mortality and adult natural mortality as

$$\vec{mort}_{nat} = \vec{\alpha} * \vec{mort}_{nat_{juv}} + (1 - \vec{\alpha}) * \vec{mort}_{nat_{adult}}$$

## 4.2 Selectivity

These parameters are used to compute the scallop selectivity as a function of its length. MA and GB have respective values for each term. GB will also distinguish between open and closed areas.

$$selectivity = 1 / (1 + \exp(select_a - select_b * (l_{shell} + 2.5)))$$

Table 2 Selectivity

	MA	GB Open	GB Closed
FSelect A	20.5079	17.72	21.7345
FSelect B	0.19845	0.15795	0.2193

## 4.3 Incidental

Table 3 Incidental

MA	0.05
GB	0.1

## 4.4 Discard

Discard determines how many scallops are thrown out of a catch. It is determined by scallop length and if the area is closed.

```
if ((length > cull_size) OR is_closed) then
  SetDiscard = 0.0
else
  SetDiscard = discard * selectivity
```

Table 4 Discard

	Cull Size	Discard
MA	90.0	0.2
GB	100.0	0.2

## 4.5 Overall Mortality, M

$$M = natural_{mortality} + Fishing_{effort} * (selectivity + incidental + discard)$$

## 4.6 Computing Landings Per Unit Effort, LPUE

The simulation uses the following parameters to compute LPUE

Table 5 LPUE

	Default
LPUE Slope	0.6556
LPUE Slope2	2.3
LPUE Intercept	1094.0
Max # of Scallops Shucked Per Day	56000.0
Max # of Hours Dredging Per Day	19.0
Dredge Width in meters	9.144
Towing Speed in knots	4.8

$$W_{expl} = \frac{EBMS}{N_{scallops}}, \text{ weight in grams}$$

$$EBMS_{tow} = EBMS * Tow_{sqm}, \text{ biomass in grams}$$

$$slope_1 = lpue_{slope} * EBMS_{tow} + lpue_{intercept}$$

$$slope_2 = LPU E_{slope_2} * EBMS_{tow}$$

$$LPU E_{limit} = max_{per\ day} * W_{expl} / 453.592$$

$$LPU E = \min(slope_1, slope_2, LPU E_{limit})$$



## 5 Main

### 5.1 Growth subframe that identifies

These are the parameters used to control how long the scallop growth is simulated as well as the granularity of the growth computations

- Start Year of the simulation
- Stop Year of the simulation
- Time Steps per year
- Domain Name or region of interest, Mid-Atlantic, MA, or Georges Bank, GB
- Sort By Statum: Used when processing Georges-Bank to break the region into quadrants due to its unique shape

### 5.2 Recruitment

Recruitment is only applied at a certain time of the year. These values determine this period. Combo boxes are used to format the formatting of the month and day.

- Start Day, calendar day of the year when recruitment influence begins.
- Stop Day, calendar day of the year when recruitment influence ends

### 5.3 Configuration Files

Files used by the sim to set up parameters. The GUI can use the default values or change the names before starting the sim. The initial names are the default names of the files when first downloaded from GitHub. The names can be changed and the GUI sets up the simulation to use the new names.

### 5.4 Output Selection

Checkboxes to allow the user to select the desired parameters of interest. This is used to save processing time rather than processing everything. Especially true during interpolation as it would take over an hour to do the interpolation. For example for MA with 11631 grid locations.

- Approx 2 minutes per interpolation
- Given 3 years worth of data, plus initial conditions
- 9 listed outputs

Thus  $9 \times 4 \times 2$  or 72 minutes. GB is proportionately shorter with only 6802 grid locations.

## 6 Sort By Area Frame

Assists the user in defining areas of interest to assess accumulated parameters located in these areas of interest.

### 6.1 Number of Areas

The number of defined areas. This is limited by Max Areas of Interest. See SHOW Args button The # of Areas is limited by default to 25. See SHOW Args for current values. The user can modify this on the command line:

```
.\\PythonScripts\\GUI\\GeoSAM\\GeoSams.py Areas Nodes
```

Default (same as started with no arguments):

```
.\\PythonScripts\\GUI\\GeoSAM\\GeoSams.py 25 8
```

### 6.2 Output Parameters

This is a dropbox of the selected output parameters on the main tab. After a simulation and interpolation have been run, the user would select one of these output, click Run Sort, and the amount of that output in each of the defined areas is accumulated by year to the left of each area.

### 6.3 Load and Save Data Sort Files

These buttons allow the user to load a predefined set of areas or to save the current set to the named file.

### 6.4 Run Sort

This will start the program to check if a region grid value for a given year is within one of the specified area and if so accumulate the year sum with that value.

### 6.5 Area SubFrames

#### 6.5.1 YYYY

For each year, from Start Year to Stop Year as given in the Main tab an entry box is provided to store the accumulated parameter for that year. These are not populated until after the Run Sort button has been clicked.

#### 6.5.2 Comment

Optional. Enter a comment to describe the area being specified.

#### 6.5.3 # Corners

Also called nodes or sides. This is limited by Max Nodes in Area. See SHOW Args for current values. This can be changed on the command line. See above

#### 6.5.4 Corner N

These are the coordinates of the area vertices. Enter the Longitude and Latitude of the vertices for the area. It is up to the user to ensure that a closed shape is defined.

## **7 Sort By Region Frame**

Assists the user in viewing accumulated parameters located in zones defined by shapefiles.

### **7.1 Output Parameters**

This is a dropbox of the selected output parameters on the main tab. After a simulation and interpolation have been run, the user would select one of these output, click Run Sort, and the amount of that output in each of the shapefile regions is accumulated by year.

### **7.2 Run Sort**

This will start the program to check if a region grid value for a given year is within one of the specified area and if so accumulate the year sum with that value.

## 8 Model Buffer, SortIntoColumns

For a given point, check each of the polygons in a given shape file.

If in that polygon set BUFFER\_<shape> to 1.

The region and buffer shapefiles for GB and MA are attached. **Column** "Region" for all shapefiles is the modeling region, which makes columns "REGION" and "BUFFER\_REGION" in the csvs.

Buffer is larger than the modeling region, so some data outside the modeling region but close to the boundary could be within the buffer and used to construct the models. Some data will be used several times for different models if multiple modeling regions are nearby. For example, within the blue circle in the below MA plot are a few data points outside SAMS but within the buffer, which will be used by two modeling regions. For this reason, created multiple BUFFER\_REGION columns for the survey data X\_Y\_BIOM\_AL2022\_XX\_BUFFER.csv. The output from the R code, X\_Y\_BIOM\_AL2022\_XX\_BUFFER\_GAM.csv, has a longer length than the input X\_Y\_BIOM\_AL2022\_XX\_BUFFER.csv because some data were used several times, and to make the query in the Python part easier I just duplicated some of the data. **Column** "BUFFER" in X\_Y\_BIOM\_AL2022\_XX\_BUFFER\_GAM.csv indicates which modeling region's buffer the data and GAM estimates/residuals belong to.

## 9 Special Access Area

This frame in conjunction with the FishingMort in Special Access frame is used to define fishing mortalities within a defined area for a specified year.

If a sim data point falls within a defined area given in this frame by the assigned area number. Then if the current year is the same as the year given in the FishingMort in Special Access frame and the area number is listed then the fishing mortality is specified by the Mortality value. Otherwise it is the default value which is defined in the Growth Frame as Fishing mortality #

### 9.1 Number of Areas

The number of areas the user wishes to define. This is limited by Max Areas of Interest. See SHOW Args button

The # of Areas is limited by default to 25. See SHOW Args. The user can modify this on the command line:

```
.\\PythonScripts\\GUI\\GeoSAM\\GeoSams.py #Areas #Nodes Default: python  
.\\PythonScripts\\GUI\\GeoSAM\\GeoSams.py 25 8
```

### 9.2 Special Access File

The name of the file used to hold this information. The user can load the default file 'SpecialAreas.csv' or define and save their own configuration.

If this feature is not desired then enter NONE in the window

Use Load Special Area File to load a predefined set of data

Use Save Special Area File to save the currently displayed setting

### 9.3 Area Definitions

#### 9.3.1 Area N

- Comment: Optional. Enter a comment to describe the area being specified.

#### 9.3.2 Corners:

Also called nodes or sides. This is limited by Max Nodes in Area. See SHOW Args for current values. This can be changed on the command line. See above

#### 9.3.3 Corner N

These are the coordinates of the area vertices. Enter the Longitude and Latitude of the vertices for the area. It is up to the user to ensure that a closed shape is defined.

# 10 Namespace Index

## 10.1 Package List

Here are the packages with brief descriptions (if available):

<b>AreaManager</b>	18
<b>EditMathSetupFrame</b>	19
<b>FishMortBySpecAcc</b>	20
<b>GeoSams</b>	20
<b>Globals</b>	20
<b>GrowthFrame</b>	23
<b>MainInputFrame</b>	23
<b>PointInPolygon</b>	23
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<b>ShapeTest</b>	29
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<b>SortByRegionFrame</b>	31
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# 11 Hierarchical Index

## 11.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

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shapefile._Array .....	35
SortIntoColumns.Column .....	45
AreaManager.Corner .....	46
Exception	
shapefile.ShapefileException .....	98
tk.Frame	
AreaManager.AreaMgrSubFrame .....	41
Widgets.ScrollFrame .....	93
Widgets.SubFrameElement.....	118
Widgets.SubFrameInterpFunction.....	119
Widgets.SubFrameXY .....	121
ttk.Frame	
AreaManager.AreaManager.....	38
EditMathSetupFrame.EditMathSetup.....	47
FishMortBySpecAcc.FishMortBySpecAcc .....	50
GrowthFrame.Growth.....	57
MainInputFrame.MainInput.....	75
SortByAreaFrame.SortByArea.....	101
SortByRegionFrame.SortByRegion .....	107
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ShapeTest.GeoShape .....	54
SortByRegionFrame.GeoShape .....	55
SortIntoColumns.GeoShape.....	56
list	
shapefile.ShapeRecords .....	100
shapefile.Shapes .....	101
shapefile._Record .....	35
object	
shapefile.Reader .....	84
shapefile.Shape.....	95
shapefile.ShapeRecord.....	99
shapefile.Writer .....	122
tk.Tk	

GeoSams.MainApplication .....	66
GrowthFrame.Growth.....	57



# 12 Class Index

## 12.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

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<b>shapefile._Record</b>	35
<b>AreaManager.AreaManager</b> (This class is used to paint area grouped by )	38
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<b>SortIntoColumns.Column</b>	45
<b>AreaManager.Corner</b> (Defines floating point data for corner defintions )	46
<b>EditMathSetupFrame.EditMathSetup</b> (This class allows the user to edit the Matlab/Octave setup files to fit their environment )	47
<b>FishMortBySpecAcc.FishMortBySpecAcc</b> (This class is used to assist the user in defining areas of interest to assess accumulated parameters located in these areas of interest )	50
<b>ShapeTest.GeoShape</b>	54
<b>SortByRegionFrame.GeoShape</b> (This class is used to define the shape of the regional data )	55
<b>SortIntoColumns.GeoShape</b>	56
<b>GrowthFrame.Growth</b> (This class allows the user to adjust parameters used in computing scallop growth )	57
<b>GeoSams.MainApplication</b> (This class is the parent class for the GUI )	66
<b>MainInputFrame.MainInput</b> (This class displays information about GeoSAMS simulation )	75
<b>shapefile.Reader</b>	84
<b>Widgets.ScrollFrame</b> (Scrollable Frame Class from <a href="https://gist.github.com/mp035/9f2027c3ef9172264532fcd6262f3b01">https://gist.github.com/mp035/9f2027c3ef9172264532fcd6262f3b01</a> )	93
<b>shapefile.Shape</b>	95
<b>shapefile.ShapefileException</b>	98
<b>shapefile.ShapeRecord</b>	99
<b>shapefile.ShapeRecords</b>	100
<b>shapefile.Shapes</b>	101
<b>SortByAreaFrame.SortByArea</b> (This class is used to assist the user in defining areas of interest to assess accumulated parameters located in these areas of interest )	101
<b>SortByRegionFrame.SortByRegion</b> (This class is used to assist the user in defining areas of interest to assess accumulated parameters located in these areas of interest )	107
<b>SpecialAreaFrame.SpecialArea</b> (This class is used to assist the user in defining areas of interest to assess accumulated parameters located in these areas of interest )	113
<b>Widgets.SubFrameElement</b> (Generic Element )	118
<b>Widgets.SubFrameInterpFunction</b>	119
<b>Widgets.SubFrameXY</b> (Widget for XY label and entery )	121
<b>shapefile.Writer</b>	122

# 13 File Index

## 13.1 File List

Here is a list of all files with brief descriptions:

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<b>EditMathSetupFrame.py</b>	131
<b>FishMortBySpecAcc.py</b>	131
<b>GeoSams.py</b>	131
<b>Globals.py</b>	132
<b>GrowthFrame.py</b>	132
<b>MainInputFrame.py</b>	133
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# 14 Namespace Documentation

## 14.1 AreaManager Namespace Reference

### 14.1.1 Classes

class **AreaManager***This class is used to paint area grouped by.*

- class **AreaMgrSubFrame**class **Corner**  
*Defines floating point data for corner defintions.*

## 14.2 EditMathSetupFrame Namespace Reference

### 14.2.1 Classes

class **EditMathSetup***This class allows the user to edit the Matlab/Octave setup files to fit their environment.*

## 14.3 FishMortBySpecAcc Namespace Reference

### 14.3.1 Classes

class **FishMortBySpecAcc***This class is used to assist the user in defining areas of interest to assess accumulated parameters located in these areas of interest.*

## 14.4 GeoSams Namespace Reference

### 14.4.1 Classes

class **MainApplication***This class is the parent class for the GUI.*

### 14.4.2 Functions

- **ComputeResiduals** (obsFile, gridFile, procID, retDict)
- **main** ()

### 14.4.3 Function Documentation

14.4.3.1 **GeoSams.ComputeResiduals** ( *obsFile*, *gridFile*, *procID*, *retDict*)

14.4.3.2 **GeoSams.main** ()

## 14.5 Globals Namespace Reference

### 14.5.1 Functions

- **DetermineUnitsScale** (desiredParam)
- **UpdateEntry** (entry, val)
- **ShowMessage** (heading, message, type='info', timeout=2500)  
*This method will display the message and then go away after the default time.*

### 14.5.2 Variables

- str **analDir** = 'Analysis'
- str **configDir** = 'Configuration'
- str **dataDir** = 'Data'
- str **gridDir** = 'Grids'
- str **interCfgDir** = 'Interpolation'
- str **resultsDir** = 'Results'
- str **shapeFileDir** = 'Shapefiles'
- str **simCfgDir** = 'Simulation'
- str **specAccCfgDir** = 'SpecialAccess'
- str **surveyDataDir** = 'OriginalData'
- list **comboTFStr** = ['T', 'F']
- list **cornerLabelArr** = ['Corner', 'Long', 'Lat ', '0.0', '0.0']
- int **frameWidth** = 400
- int **frameHeight** = 200

- `int scrollFrameHeight = 600`
- `int helpXoffset = 700`
- `int helpYoffset = 50`
- `int meters_per_naut_mile = 1852`
- `int grid_area_sqm = meters_per_naut_mile**2`
- `str ABUN = 'ABUN_'`
- `str BIOM = 'BIOM_'`
- `str EBMS = 'EBMS_'`
- `str FEFF = 'FEFF_'`
- `str FMOR = 'FMOR_'`
- `str LAND = 'LAND_'`
- `str LNDW = 'LNDW_'`
- `str LPUE = 'LPUE_'`
- `str RECR = 'RECR_'`
- `int scrollFrameWidth = 900`
- `str geometryStr = '920x725+10+10'`

### 14.5.3 Function Documentation

14.5.3.1 `Globals.DetermineUnitsScale ( desiredParam )`

14.5.3.2 `Globals.ShowMessage ( heading, message, type = 'info', timeout = 2500 )`

This method will display the message and then go away after the default time.

14.5.3.3 `Globals.UpdateEntry ( entry, val )`

## 14.5.4 Variable Documentation

- 14.5.4.1 str Globals.ABUN = 'ABUN\_'
- 14.5.4.2 str Globals.analDir = 'Analysis'
- 14.5.4.3 str Globals.BIOM = 'BIOM\_'
- 14.5.4.4 list Globals.comboTFStr = ['T', 'F']
- 14.5.4.5 str Globals.configDir = 'Configuration'
- 14.5.4.6 list Globals.cornerLabelArr = ['Corner', 'Long', 'Lat ', '0.0', '0.0']
- 14.5.4.7 str Globals.dataDir = 'Data'
- 14.5.4.8 str Globals.EBMS = 'EBMS\_'
- 14.5.4.9 str Globals.FEFF = 'FEFF\_'
- 14.5.4.10 str Globals.FMOR = 'FMOR\_'
- 14.5.4.11 int Globals.frameHeight = 200
- 14.5.4.12 int Globals.frameWidth = 400
- 14.5.4.13 str Globals.geometryStr = '920x725+10+10'
- 14.5.4.14 int Globals.grid\_area\_sqm = meters\_per\_naut\_mile\*\*2
- 14.5.4.15 str Globals.gridDir = 'Grids'
- 14.5.4.16 int Globals.helpXoffset = 700
- 14.5.4.17 int Globals.helpYoffset = 50
- 14.5.4.18 str Globals.interCfgDir = 'Interpolation'
- 14.5.4.19 str Globals.LAND = 'LAND\_'
- 14.5.4.20 str Globals.LNDW = 'LNDW\_'
- 14.5.4.21 str Globals.LPUE = 'LPUE\_'
- 14.5.4.22 int Globals.meters\_per\_naut\_mile = 1852
- 14.5.4.23 str Globals.RECR = 'RECR\_'

14.5.4.24 str Globals.resultsDir = 'Results'

14.5.4.25 int Globals.scrollFrameHeight = 600

14.5.4.26 int Globals.scrollFrameWidth = 900

14.5.4.27 str Globals.shapeFileDir = 'Shapefiles'

14.5.4.28 str Globals.simCfgDir = 'Simulation'

14.5.4.29 str Globals.specAccCfgDir = 'SpecialAccess'

14.5.4.30 str Globals.surveyDataDir = 'OriginalData'

## 14.6 GrowthFrame Namespace Reference

### 14.6.1 Classes

class **Growth***This class allows the user to adjust parameters used in computing scallop growth.*

## 14.7 MainInputFrame Namespace Reference

### 14.7.1 Classes

class **MainInput***This class displays information about GeoSAMS simulation.*

## 14.8 PointInPolygon Namespace Reference

### 14.8.1 Functions

- **PointInPolygon** (polyX, polyY, x, y, nodes)

### 14.8.2 Function Documentation

14.8.2.1 **PointInPolygon.PointInPolygon** ( polyX, polyY, x, y, nodes)

```
@param float polyX Array of horizontal, coordinates of corners
@param float polyY Array of vertical coordinates of corners
@param float x horizontal coordinate of point we wish to determine if inside polygram
@param float y vertical coordinate of point we wish to determine if inside polygram
@param int nodes the number of corners, edges, that define the polygon
@returns true if point is inside polygram or if on vert or horiz edge,
         false if outside
         if point is on rise of falling edge then it may return true or false
```

## 14.9 shapefile Namespace Reference

### 14.9.1 Classes

- class **\_Array**class **\_Record**



- class **Reader**
- class **Shape**
- class **ShapefileException**
- class **ShapeRecord**
- class **ShapeRecords**
- class **Shapes**
- class **Writer**

### 14.9.2 Functions

- **b** (v, encoding='utf-8', encodingErrors='strict')
- **u** (v, encoding='utf-8', encodingErrors='strict')
- **is\_string** (v)
- **pathlike\_obj** (path)
- **signed\_area** (coords, fast=False)
- **is\_cw** (coords)
- **rewind** (coords)
- **ring\_bbox** (coords)
- **bbox\_overlap** (bbox1, bbox2)
- **bbox\_contains** (bbox1, bbox2)
- **ring\_contains\_point** (coords, p)
- **ring\_sample** (coords, ccw=False)
- **ring\_contains\_ring** (coords1, coords2)
- **organize\_polygon\_rings** (rings, return\_errors=None)
- **test** (\*\*kwargs)

### 14.9.3 Variables

- **str \_\_version\_\_** = "2.3.1"
- **logger** = logging.getLogger(\_\_name\_\_)
- **bool VERBOSE** = True
- **int NULL** = 0
- **int POINT** = 1
- **int POLYLINE** = 3
- **int POLYGON** = 5
- **int MULTIPOINT** = 8
- **int POINTZ** = 11
- **int POLYLINEZ** = 13
- **int POLYGONZ** = 15
- **int MULTIPOINTZ** = 18
- **int POINTM** = 21
- **int POLYLINEM** = 23
- **int POLYGONM** = 25
- **int MULTIPOINTM** = 28
- **int MULTIPATCH** = 31
- **dict SHAPETYPE\_LOOKUP**
- **int TRIANGLE\_STRIP** = 0
- **int TRIANGLE\_FAN** = 1
- **int OUTER\_RING** = 2
- **int INNER\_RING** = 3
- **int FIRST\_RING** = 4
- **int RING** = 5
- **dict PARTTYPE\_LOOKUP**
- **int PYTHON3** = 3

- **xrange** = range
- **izip** = zip
- list **MISSING** = [None,"]
- int **NODATA** = -10e38
- **failure\_count** = test()

#### 14.9.4 Detailed Description

```
shapefile.py
Provides read and write support for ESRI Shapefiles.
authors: jlawhead<at>geospatialpython.com
maintainer: karim.bahgat.norway<at>gmail.com
Compatible with Python versions 2.7-3.x
```

#### 14.9.5 Function Documentation

14.9.5.1 `shapefile.b ( v, encoding = 'utf-8', encodingErrors = 'strict')`

14.9.5.2 `shapefile.bbox_contains ( bbox1, bbox2)`

Tests whether bbox1 fully contains bbox2, returning a boolean

14.9.5.3 `shapefile.bbox_overlap ( bbox1, bbox2)`

Tests whether two bounding boxes overlap, returning a boolean

14.9.5.4 `shapefile.is_cw ( coords)`

Returns True if a polygon ring has clockwise orientation, determined by a negatively signed area.

14.9.5.5 `shapefile.is_string ( v)`

14.9.5.6 `shapefile.organize_polygon_rings ( rings, return_errors = None)`

Organize a list of coordinate rings into one or more polygons with holes. Returns a list of polygons, where each polygon is composed of a single exterior ring, and one or more interior holes. If a return\_errors dict is provided (optional), any errors encountered will be added to it.

Rings must be closed, and cannot intersect each other (non-self-intersecting polygon). Rings are determined as exteriors if they run in clockwise direction, or interior holes if they run in counter-clockwise direction. This method is used to construct GeoJSON (multi)polygons from the shapefile polygon shape type, which does not explicitly store the structure of the polygons beyond exterior/interior ring orientation.

#### 14.9.5.7 `shapefile.pathlike_obj ( path)`

#### 14.9.5.8 `shapefile.rewind ( coords)`

Returns the input coords in reversed order.

#### 14.9.5.9 `shapefile.ring_bbox ( coords)`

Calculates and returns the bounding box of a ring.

#### 14.9.5.10 `shapefile.ring_contains_point ( coords, p)`

Fast point-in-polygon crossings algorithm, MacMartin optimization.

Adapted from code by Eric Haynes

[http://www.realtimerendering.com/resources/GraphicsGems//gemsiv/ptpoly\\_haines/ptinpoly.c](http://www.realtimerendering.com/resources/GraphicsGems//gemsiv/ptpoly_haines/ptinpoly.c)

Original description:

Shoot a test ray along +X axis. The strategy, from MacMartin, is to compare vertex Y values to the testing point's Y and quickly discard edges which are entirely to one side of the test ray.

#### 14.9.5.11 `shapefile.ring_contains_ring ( coords1, coords2)`

Returns True if all vertexes in coords2 are fully inside coords1.

#### 14.9.5.12 `shapefile.ring_sample ( coords, ccw = False)`

Return a sample point guaranteed to be within a ring, by efficiently finding the first centroid of a coordinate triplet whose orientation matches the orientation of the ring and passes the point-in-ring test. The orientation of the ring is assumed to be clockwise, unless ccw (counter-clockwise) is set to True.

#### 14.9.5.13 `shapefile.signed_area ( coords, fast = False)`

Return the signed area enclosed by a ring using the linear time algorithm. A value  $\geq 0$  indicates a counter-clockwise oriented ring. A faster version is possible by setting 'fast' to True, which returns 2x the area, e.g. if you're only interested in the sign of the area.

14.9.5.14 `shapefile.test (** kwargs)`

14.9.5.15 `shapefile.u ( v, encoding = 'utf-8', encodingErrors = 'strict')`

## 14.9.6 Variable Documentation

14.9.6.1 `str shapefile.__version__ = "2.3.1"[private]`

14.9.6.2 `shapefile.failure_count = test()`

14.9.6.3 `int shapefile.FIRST_RING = 4`

14.9.6.4 `int shapefile.INNER_RING = 3`

14.9.6.5 `shapefile.izip = zip`

14.9.6.6 `shapefile.logger = logging.getLogger(__name__)`

14.9.6.7 `list shapefile.MISSING = [None,""]`

14.9.6.8 `int shapefile.MULTIPATCH = 31`

14.9.6.9 `int shapefile.MULTIPOINT = 8`

14.9.6.10 `int shapefile.MULTIPOINTM = 28`

14.9.6.11 `int shapefile.MULTIPOINTZ = 18`

14.9.6.12 `int shapefile.NODATA = -10e38`

14.9.6.13 `int shapefile.NULL = 0`

14.9.6.14 `int shapefile.OUTER_RING = 2`

14.9.6.15 `dict shapefile.PARTTYPE_LOOKUP`

```
Initial value:1 = {
2     0: 'TRIANGLE_STRIP',
3     1: 'TRIANGLE_FAN',
4     2: 'OUTER_RING',
5     3: 'INNER_RING',
6     4: 'FIRST_RING',
7     5: 'RING'}
```

14.9.6.16 int shapefile.POINT = 1

14.9.6.17 int shapefile.POINTM = 21

14.9.6.18 int shapefile.POINTZ = 11

14.9.6.19 int shapefile.POLYGON = 5

14.9.6.20 int shapefile.POLYGONM = 25

14.9.6.21 int shapefile.POLYGONZ = 15

14.9.6.22 int shapefile.POLYLINE = 3

14.9.6.23 int shapefile.POLYLINEM = 23

14.9.6.24 int shapefile.POLYLINEZ = 13

14.9.6.25 int shapefile.PYTHON3 = 3

14.9.6.26 int shapefile.RING = 5

14.9.6.27 dict shapefile.SHAPETYPE\_LOOKUP

```
Initial value:1 = {
2     0: 'NULL',
3     1: 'POINT',
4     3: 'POLYLINE',
5     5: 'POLYGON',
6     8: 'MULTIPOINT',
7    11: 'POINTZ',
8    13: 'POLYLINEZ',
9    15: 'POLYGONZ',
10   18: 'MULTIPOINTZ',
11   21: 'POINTM',
12   23: 'POLYLINEM',
13   25: 'POLYGONM',
14   28: 'MULTIPOINTM',
15   31: 'MULTIPATCH' }
```

14.9.6.28 int shapefile.TRIANGLE\_FAN = 1

14.9.6.29 int shapefile.TRIANGLE\_STRIP = 0

14.9.6.30 bool shapefile.VERBOSE = True

14.9.6.31 shapefile.xrange = range

## 14.10 ShapeTest Namespace Reference

### 14.10.1 Classes

#### 14.10.2 class GeoShapeVariables

- **sf** = **shapefile.Reader**("Shapefiles/MAB\_Estimation\_Areas\_2019\_UTM18\_PDT.shp")
- **shapes** = **sf.shapes()**
- **shapeLen** = **len(sf)**
- list **shapeMA** = [ **GeoShape()** for \_ in range(**shapeLen**)]
- **record** = **sf.record(n)**
- **as\_dict** = **record.as\_dict()**
- **SAMS**
- **NewSAMS**
- **areaKm2**
- **pointLen** = **len(shapes[n].points)**
- **X**
- **Y**
- **lat**
- **lon**
- list **shapeGB** = [ **GeoShape()** for \_ in range(**shapeLen**)]

### **14.10.3 Variable Documentation**

14.10.3.1 ShapeTest.areaKm2

14.10.3.2 ShapeTest.as\_dict = record.as\_dict()

14.10.3.3 ShapeTest.lat

14.10.3.4 ShapeTest.lon

14.10.3.5 ShapeTest.NewSAMS

14.10.3.6 ShapeTest.pointLen = len(shapes[n].points)

14.10.3.7 ShapeTest.record = sf.record(n)

14.10.3.8 ShapeTest.SAMS

14.10.3.9 ShapeTest.sf =  
    shapefile.Reader("Shapefiles/MAB\_Estimation\_Areas\_2019\_UTM18\_PDT.shp")

14.10.3.10 list ShapeTest.shapeGB = [ GeoShape() for \_ in range(shapeLen)]

14.10.3.11 ShapeTest.shapeLen = len(sf)

14.10.3.12 list ShapeTest.shapeMA = [ GeoShape() for \_ in range(shapeLen)]

14.10.3.13 ShapeTest.shapes = sf.shapes()

14.10.3.14 ShapeTest.X

14.10.3.15 ShapeTest.Y

## 14.11 SortByAreaFrame Namespace Reference

### 14.11.1 Classes

class **SortByArea***This class is used to assist the user in defining areas of interest to assess accumulated parameters located in these areas of interest.*

## 14.12 SortByRegionFrame Namespace Reference

### 14.12.1 Classes

class **GeoShape***This class is used to define the shape of the regional data.*

class **SortByRegion***This class is used to assist the user in defining areas of interest to assess accumulated parameters located in these areas of interest.*

## 14.13 SortIntoColumns Namespace Reference

### 14.13.1 Classes

- class **Column**class **GeoShape**

### 14.13.2 Variables

- **inputFile** = sys.argv[1]
- **l** = len(inputFile)
- **domain** = inputFile[l-2:l]
- **dataFile** = os.path.join('Data', inputFile+'.csv')
- **outfile** = os.path.join('Data', inputFile+'\_BUFFER.csv')
- **M** = pd.read\_csv(dataFile)
- **fileName** = os.environ['GBShapeBufferFile']
- **str subDir** = 'GB\_Buffer'
- **shapeFile** = os.path.join('Shapefiles', subDir, fileName)
- **sf** = shapefile.Reader(shapeFile)
- **shapes** = sf.shapes()
- **shapeLen** = len(sf)
- **list shape** = [ **GeoShape**() for \_ in range(shapeLen)]
- **record** = sf.record(n)
- **as\_dict** = record.as\_dict()
- **Region**
- **pointLen** = len(shapes[n].points)
- **X**
- **Y**
- **list columns** = [**Column**() for \_ in range(shapeLen)]
- **name**
- **X\_t** = M['UTM\_X']
- **Y\_t** = M['UTM\_Y']
- **rows** = len(X\_t)
- **nodes** = len(shape[rgn].X)
- **sep**



- **na\_rep**
- **index**

### 14.13.3 Variable Documentation

- 14.13.3.1 `SortIntoColumns.as_dict = record.as_dict()`
- 14.13.3.2 `list SortIntoColumns.columns = [Column() for _ in range(shapeLen)]`
- 14.13.3.3 `SortIntoColumns.dataFile = os.path.join('Data', inputFile+'.csv')`
- 14.13.3.4 `SortIntoColumns.domain = inputFile[-2:]`
- 14.13.3.5 `SortIntoColumns.fileName = os.environ['GBShapeBufferFile']`
- 14.13.3.6 `SortIntoColumns.index`
- 14.13.3.7 `SortIntoColumns.inputFile = sys.argv[1]`
- 14.13.3.8 `SortIntoColumns.l = len(inputFile)`
- 14.13.3.9 `SortIntoColumns.M = pd.read_csv(dataFile)`
- 14.13.3.10 `SortIntoColumns.na_rep`
- 14.13.3.11 `SortIntoColumns.name`
- 14.13.3.12 `SortIntoColumns.nodes = len(shape[rgn].X)`
- 14.13.3.13 `SortIntoColumns.outfile = os.path.join('Data', inputFile+'_BUFFER.csv')`
- 14.13.3.14 `SortIntoColumns.pointLen = len(shapes[n].points)`
- 14.13.3.15 `SortIntoColumns.record = sf.record(n)`
- 14.13.3.16 `SortIntoColumns.Region`
- 14.13.3.17 `SortIntoColumns.rows = len(X_t)`
- 14.13.3.18 `SortIntoColumns.sep`
- 14.13.3.19 `SortIntoColumns.sf = shapefile.Reader(shapeFile)`
- 14.13.3.20 `list SortIntoColumns.shape = [ GeoShape() for _ in range(shapeLen)]`
- 14.13.3.21 `SortIntoColumns.shapeFile = os.path.join('Shapefiles', subDir, fileName)`
- 14.13.3.22 `SortIntoColumns.shapeLen = len(sf)`
- 14.13.3.23 `SortIntoColumns.shapes = sf.shapes()`

14.13.3.24 `str SortIntoColumns.subDir = 'GB_Buffer'`

14.13.3.25 `SortIntoColumns.X`

14.13.3.26 `SortIntoColumns.X_t = M['UTM_X']`

14.13.3.27 `SortIntoColumns.Y`

14.13.3.28 `SortIntoColumns.Y_t = M['UTM_Y']`

## 14.14 SpecialAreaFrame Namespace Reference

### 14.14.1 Classes

class **SpecialArea***This class is used to assist the user in defining areas of interest to assess accumulated parameters located in these areas of interest.*

## 14.15 Widgets Namespace Reference

### 14.15.1 Classes

class **ScrollFrameScrollable** *Frame Class from*  
*<https://gist.github.com/mp035/9f2027c3ef9172264532fcd6262f3b01>.*

class **SubFrameElement***Generic Element.*

- class **SubFrameInterpFunction***class SubFrameXY*  
*Widget for XY label and entry.*

### 14.15.2 Functions

- **numbersCallback** (input)  
*Allows only correctly formed positive integers, ignores non-numeric characters.*
- **floatCallback** (input)  
*Allows only correctly formed floats, ignores non-numeric characters.*

### 14.15.3 Function Documentation

14.15.3.1 `Widgets.floatCallback ( input)`

Allows only correctly formed floats, ignores non-numeric characters.

14.15.3.2 `Widgets.numbersCallback ( input)`

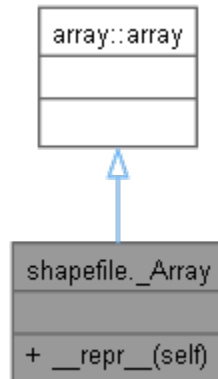
Allows only correctly formed positive integers, ignores non-numeric characters.

Only allows numeric for input

## 15 Class Documentation

### 15.1 shapefile.\_Array Class Reference

Inheritance diagram for shapefile.\_Array:



#### 15.1.1 Public Member Functions

- `__repr__(self)`

#### 15.1.2 Detailed Description

Converts python tuples to lists of the appropriate type.

Used to unpack different shapefile header parts.

#### 15.1.3 Member Function Documentation

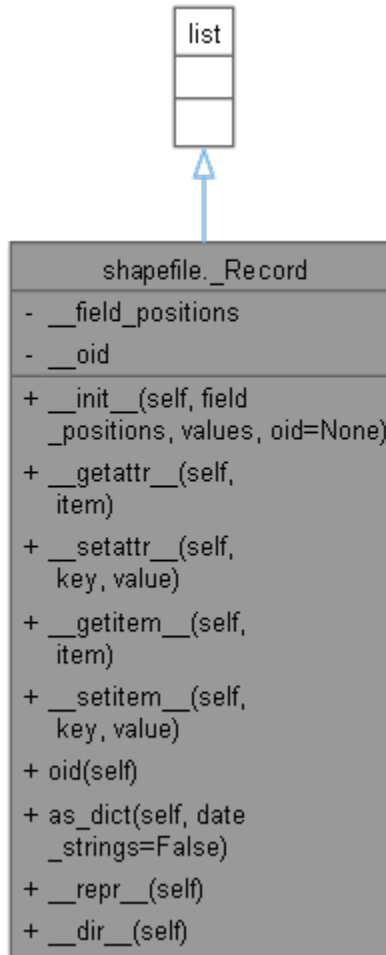
15.1.3.1 `shapefile._Array.__repr__( self)`

15.1.3.2 The documentation for this class was generated from the following file:

- `PyshpMaster/shapefile.py`

### 15.2 shapefile.\_Record Class Reference

Inheritance diagram for shapefile.\_Record:



### 15.2.1 Public Member Functions

- `__init__` (self, field\_positions, values, **oid**=None)
- `__getattr__` (self, item)
- `__setattr__` (self, key, value)
- `__getitem__` (self, item)
- `__setitem__` (self, key, value)
- `oid` (self)
- `as_dict` (self, date\_strings=False)
- `__repr__` (self)
- `__dir__` (self)

### 15.2.2 Private Attributes

- `__field_positions__oid`

### 15.2.3 Detailed Description

A class to hold a record. Subclasses list to ensure compatibility with former work and to reuse all the optimizations of the builtin list. In addition to the list interface, the values of the record can also be retrieved using the field's name. For example if the dbf contains

a field ID at position 0, the ID can be retrieved with the position, the field name as a key, or the field name as an attribute.

```
>>> # Create a Record with one field, normally the record is created by the Reader class
>>> r = _Record({'ID': 0}, [0])
>>> print(r[0])
>>> print(r['ID'])
>>> print(r.ID)
```

## 15.2.4 Constructor & Destructor Documentation

### 15.2.4.1 `shapefile._Record.__init__( self, field_positions, values, oid = None)`

A Record should be created by the Reader class

```
:param field_positions: A dict mapping field names to field positions
:param values: A sequence of values
:param oid: The object id, an int (optional)
```

## 15.2.5 Member Function Documentation

### 15.2.5.1 `shapefile._Record.__dir__( self)`

Helps to show the field names in an interactive environment like IPython.  
See: <http://ipython.readthedocs.io/en/stable/config/integrating.html>

```
:return: List of method names and fields
```

### 15.2.5.2 `shapefile._Record.__getattr__( self, item)`

```
__getattr__ is called if an attribute is used that does
not exist in the normal sense. For example r=Record(...), r.ID
calls r.__getattr__('ID'), but r.index(5) calls list.index(r, 5)
:param item: The field name, used as attribute
:return: Value of the field
:raises: AttributeError, if item is not a field of the shapefile
        and IndexError, if the field exists but the field's
        corresponding value in the Record does not exist
```

### 15.2.5.3 `shapefile._Record.__getitem__( self, item)`

Extends the normal list item access with  
access using a fieldname

```
For example r['ID'], r[0]
:param item: Either the position of the value or the name of a field
:return: the value of the field
```

15.2.5.4 `shapefile._Record.__repr__ ( self)`

15.2.5.5 `shapefile._Record.__setattr__ ( self, key, value)`

```
Sets a value of a field attribute
:param key: The field name
:param value: the value of that field
:return: None
:raises: AttributeError, if key is not a field of the shapefile
```

15.2.5.6 `shapefile._Record.__setitem__ ( self, key, value)`

```
Extends the normal list item access with
access using a fieldname

For example r['ID']=2, r[0]=2
:param key: Either the position of the value or the name of a field
:param value: the new value of the field
```

15.2.5.7 `shapefile._Record.as_dict ( self, date_strings = False)`

```
Returns this Record as a dictionary using the field names as keys
:return: dict
```

15.2.5.8 `shapefile._Record.oid ( self)`

The index position of the record in the original shapefile

## 15.2.6 Member Data Documentation

15.2.6.1 `shapefile._Record.__field_positions[private]`

15.2.6.2 `shapefile._Record.__oid[private]`

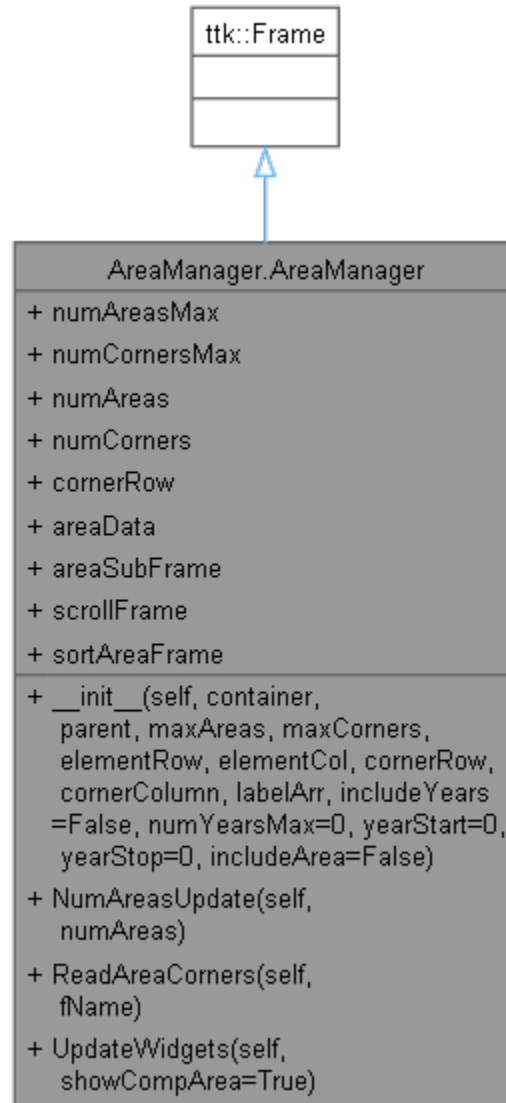
15.2.6.3 The documentation for this class was generated from the following file:

- PyshpMaster/**shapefile.py**

## 15.3 AreaManager.AreaManager Class Reference

This class is used to paint area grouped by.

Inheritance diagram for AreaManager.AreaManager:



### 15.3.1 Public Member Functions

- **`__init__`** (self, container, parent, maxAreas, maxCorners, elementRow, elementCol, **cornerRow**, cornerColumn, labelArr, includeYears=False, numYearsMax=0, yearStart=0, yearStop=0, includeArea=False)
- **`NumAreasUpdate`** (self, **numAreas**)
- **`ReadAreaCorners`** (self, fName)
- **`UpdateWidgets`** (self, showCompArea=True)

### 15.3.2 Public Attributes

- **`numAreasMax`****`numCornersMax`**
- **`numAreas`**
- **`numCorners`**
- **`cornerRow`**
- **`areaData`**
- **`areaSubFrame`**



- `scrollFrame`
- `sortAreaFrame`

### 15.3.3 Detailed Description

This class is used to paint area grouped by.

Area N Comment Number of Nodes Update Nodes Node 1 .... Node N X data .... X data Y data ....  
Y data

### 15.3.4 Constructor & Destructor Documentation

15.3.4.1 `AreaManager.AreaManager.__init__( self, container, parent, maxAreas, maxCorners, elementRow, elementCol, cornerRow, cornerColumn, labelArr, includeYears = False, numYearsMax = 0, yearStart = 0, yearStop = 0, includeArea = False)`

### 15.3.5 Member Function Documentation

15.3.5.1 `AreaManager.AreaManager.NumAreasUpdate ( self, numAreas)`

Updates the number of areas functions.

15.3.5.2 `AreaManager.AreaManager.ReadAreaCorners ( self, fName)`

Reads an Area file and returns the number of nodes defined

15.3.5.3 `AreaManager.AreaManager.UpdateWidgets ( self, showCompArea = True)`

### **15.3.6 Member Data Documentation**

15.3.6.1 `AreaManager.AreaManager.areaData`

15.3.6.2 `AreaManager.AreaManager.areaSubFrame`

15.3.6.3 `AreaManager.AreaManager.cornerRow`

15.3.6.4 `AreaManager.AreaManager.numAreas`

15.3.6.5 `AreaManager.AreaManager.numAreasMax`

15.3.6.6 `AreaManager.AreaManager.numCorners`

15.3.6.7 `AreaManager.AreaManager.numCornersMax`

15.3.6.8 `AreaManager.AreaManager.scrollFrame`

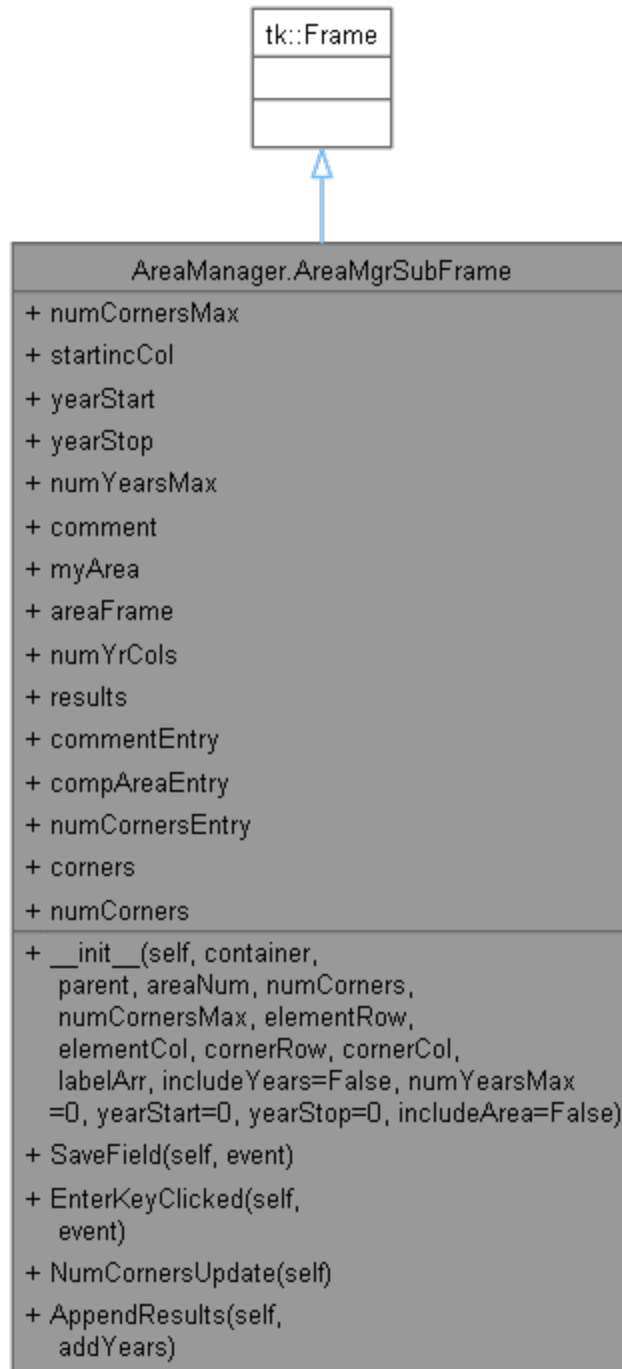
15.3.6.9 `AreaManager.AreaManager.sortAreaFrame`

15.3.6.10 The documentation for this class was generated from the following file:

15.3.6.11 `AreaManager.py`

## **15.4 AreaManager.AreaMgrSubFrame Class Reference**

Inheritance diagram for `AreaManager.AreaMgrSubFrame`:



#### 15.4.1 Public Member Functions

- **`__init__`** (self, container, parent, areaNum, **numCorners**, **numCornersMax**, elementRow, elementCol, cornerRow, cornerCol, labelArr, includeYears=False, **numYearsMax**=0, **yearStart**=0, **yearStop**=0, includeArea=False)
- **`SaveField`** (self, event)
- **`EnterKeyClicked`** (self, event)
- **`NumCornersUpdate`** (self)
- **`AppendResults`** (self, addYears)

*This method is used to add results when the original maximum number of years is exceeded.*

## 15.4.2 Public Attributes

- `numCornersMaxstartincCol`
- `yearStart`
- `yearStop`
- `numYearsMax`
- `comment`
- `myArea`
- `areaFrame`
- `numYrCols`
- `results`
- `commentEntry`
- `compAreaEntry`
- `numCornersEntry`
- `corners`
- `numCorners`

## 15.4.3 Constructor & Destructor Documentation

15.4.3.1 `AreaManager.AreaMgrSubFrame.__init__( self, container, parent, areaNum, numCorners, numCornersMax, elementRow, elementCol, cornerRow, cornerCol, labelArr, includeYears = False, numYearsMax = 0, yearStart = 0, yearStop = 0, includeArea = False)`

## 15.4.4 Member Function Documentation

15.4.4.1 `AreaManager.AreaMgrSubFrame.AppendResults ( self, addYears)`

*This method is used to add results when the original maximum number of years is exceeded.*

15.4.4.2 `AreaManager.AreaMgrSubFrame.EnterKeyClicked ( self, event)`

15.4.4.3 `AreaManager.AreaMgrSubFrame.NumCornersUpdate ( self)`

15.4.4.4 `AreaManager.AreaMgrSubFrame.SaveField ( self, event)`

## **15.4.5 Member Data Documentation**

- 15.4.5.1 `AreaManager.AreaMgrSubFrame.areaFrame`
- 15.4.5.2 `AreaManager.AreaMgrSubFrame.comment`
- 15.4.5.3 `AreaManager.AreaMgrSubFrame.commentEntry`
- 15.4.5.4 `AreaManager.AreaMgrSubFrame.compAreaEntry`
- 15.4.5.5 `AreaManager.AreaMgrSubFrame.corners`
- 15.4.5.6 `AreaManager.AreaMgrSubFrame.myArea`
- 15.4.5.7 `AreaManager.AreaMgrSubFrame.numCorners`
- 15.4.5.8 `AreaManager.AreaMgrSubFrame.numCornersEntry`
- 15.4.5.9 `AreaManager.AreaMgrSubFrame.numCornersMax`
- 15.4.5.10 `AreaManager.AreaMgrSubFrame.numYearsMax`
- 15.4.5.11 `AreaManager.AreaMgrSubFrame.numYrCols`
- 15.4.5.12 `AreaManager.AreaMgrSubFrame.results`
- 15.4.5.13 `AreaManager.AreaMgrSubFrame.startincCol`
- 15.4.5.14 `AreaManager.AreaMgrSubFrame.yearStart`
- 15.4.5.15 `AreaManager.AreaMgrSubFrame.yearStop`
- 15.4.5.16 The documentation for this class was generated from the following file:
- 15.4.5.17 `AreaManager.py`

## 15.5 SortIntoColumns.Column Class Reference

### 15.5.1 Public Member Functions

- `__init__(self)`

### 15.5.2 Public Attributes

- `nameinBox`

### 15.5.3 Constructor & Destructor Documentation

15.5.3.1 `SortIntoColumns.Column.__init__( self)`

### 15.5.4 Member Data Documentation

15.5.4.1 `SortIntoColumns.Column.inBox`

15.5.4.2 `SortIntoColumns.Column.name`

15.5.4.3 The documentation for this class was generated from the following file:

15.5.4.4 `SortIntoColumns.py`

## 15.6 AreaManager.Corner Class Reference

Defines floating point data for corner definitions.

### 15.6.1 Public Member Functions

- `__init__` (self, maxCorners)

### 15.6.2 Public Attributes

- `longlat`
- `numCorners`

### 15.6.3 Detailed Description

Defines floating point data for corner definitions.

long, lat have become interchangeable with x, y

### 15.6.4 Constructor & Destructor Documentation

15.6.4.1 `AreaManager.Corner.__init__ ( self, maxCorners)`

### 15.6.5 Member Data Documentation

15.6.5.1 `AreaManager.Corner.lat`

15.6.5.2 `AreaManager.Corner.long`

15.6.5.3 `AreaManager.Corner.numCorners`

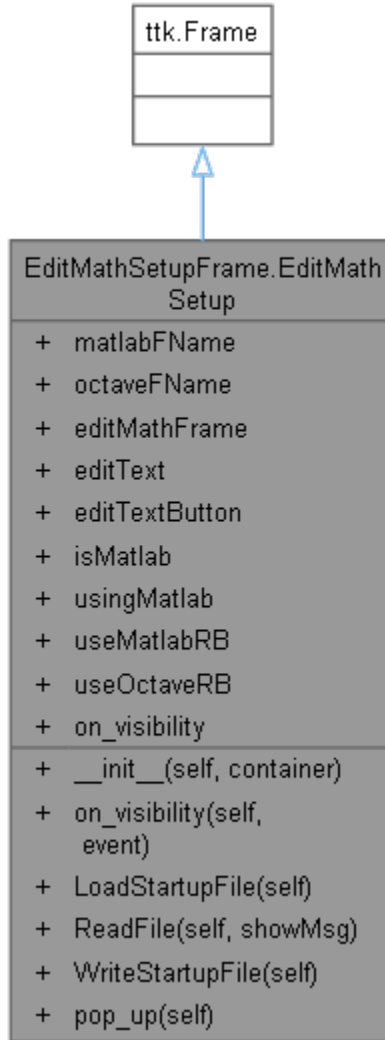
15.6.5.4 The documentation for this class was generated from the following file:

15.6.5.5 `AreaManager.py`

## 15.7 EditMathSetupFrame.EditMathSetup Class Reference

This class allows the user to edit the Matlab/Octave setup files to fit their environment.

Inheritance diagram for EditMathSetupFrame.EditMathSetup:



### 15.7.1 Public Member Functions

- `__init__(self, container)`  
*Constructor for Growth Class.*
- `on_visibility(self, event)`  
*Opens either startup.m or .octaverc depending if user selected Matlab or Octave resp.*
- `LoadStartupFile(self)`
- `ReadFile(self, showMsg)`
- `WriteStartupFile(self)`
- `pop_up(self)`



### 15.7.2 Public Attributes

- `matlabFNameoctaveFName`
- `editMathFrame`
- `editText`
- `editTextButton`
- `isMatlab`
- `usingMatlab`
- `useMatlabRB`
- `useOctaveRB`
- `on_visibility`

### 15.7.3 Detailed Description

This class allows the user to edit the Matlab/Octave setup files to fit their environment.

### 15.7.4 Constructor & Destructor Documentation

15.7.4.1 `EditMathSetupFrame.EditMathSetup.__init__ ( self, container )`

Constructor for Growth Class.

### 15.7.5 Member Function Documentation

15.7.5.1 `EditMathSetupFrame.EditMathSetup.LoadStartupFile ( self )`

15.7.5.2 `EditMathSetupFrame.EditMathSetup.on_visibility ( self, event )`

Opens either `startup.m` or `.octaverc` depending if user selected Matlab or Octave resp.

15.7.5.3 `EditMathSetupFrame.EditMathSetup.pop_up ( self )`

15.7.5.4 `EditMathSetupFrame.EditMathSetup.ReadFile ( self, showMsg )`

15.7.5.5 `EditMathSetupFrame.EditMathSetup.WriteStartupFile ( self )`

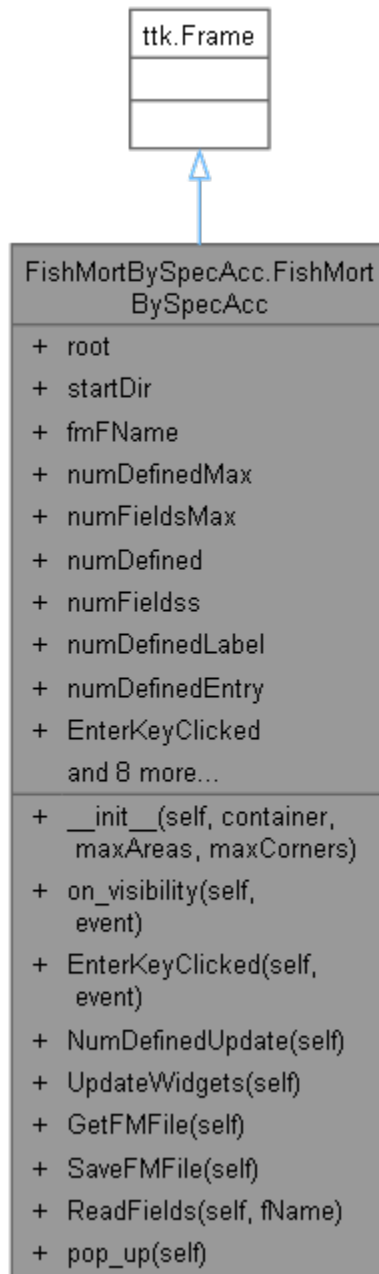
## **15.7.6 Member Data Documentation**

- 15.7.6.1 `EditMathSetupFrame.EditMathSetup.editMathFrame`
- 15.7.6.2 `EditMathSetupFrame.EditMathSetup.editText`
- 15.7.6.3 `EditMathSetupFrame.EditMathSetup.editTextButton`
- 15.7.6.4 `EditMathSetupFrame.EditMathSetup.isMatlab`
- 15.7.6.5 `EditMathSetupFrame.EditMathSetup.matlabFName`
- 15.7.6.6 `EditMathSetupFrame.EditMathSetup.octaveFName`
- 15.7.6.7 `EditMathSetupFrame.EditMathSetup.on_visibility`
- 15.7.6.8 `EditMathSetupFrame.EditMathSetup.useMatlabRB`
- 15.7.6.9 `EditMathSetupFrame.EditMathSetup.useOctaveRB`
- 15.7.6.10 `EditMathSetupFrame.EditMathSetup.usingMatlab`
- 15.7.6.11 The documentation for this class was generated from the following file:
- 15.7.6.12 `EditMathSetupFrame.py`

## 15.8 FishMortBySpecAcc.FishMortBySpecAcc Class Reference

This class is used to assist the user in defining areas of interest to assess accumulated parameters located in these areas of interest.

Inheritance diagram for FishMortBySpecAcc.FishMortBySpecAcc:



### 15.8.1 Public Member Functions

- `__init__(self, container, maxAreas, maxCorners)`

- **on\_visibility** (self, event)
- **EnterKeyClicked** (self, event)
- **NumDefinedUpdate** (self)
- **UpdateWidgets** (self)
- **GetFMFile** (self)
- **SaveFMFile** (self)
- **ReadFields** (self, fName)
- **pop\_up** (self)

*Help Window for Fishing Mortatlity in Special Access Area.*

### 15.8.2 Public Attributes

- **rootstartDir**
- **fmFName**
- **numDefinedMax**
- **numFieldsMax**
- **numDefined**
- **numFieldss**
- **numDefinedLabel**
- **numDefinedEntry**
- **EnterKeyClicked**
- **fishMortFile**
- **fishMortFileLabel**
- **openFMFileButton**
- **saveFMFileButton**
- **yearEntry**
- **areaMgr**
- **on\_visibility**
- **numAreas**

### 15.8.3 Detailed Description

This class is used to assist the user in defining areas of interest to assess accumulated parameters located in these areas of interest.

### 15.8.4 Constructor & Destructor Documentation

- 15.8.4.1 `FishMortBySpecAcc.FishMortBySpecAcc.__init__( self, container, maxAreas, maxCorners)`

## 15.8.5 Member Function Documentation

15.8.5.1 FishMortBySpecAcc.FishMortBySpecAcc.EnterKeyClicked ( *self*, *event*)

15.8.5.2 FishMortBySpecAcc.FishMortBySpecAcc.GetFMFile ( *self*)

15.8.5.3 FishMortBySpecAcc.FishMortBySpecAcc.NumDefinedUpdate ( *self*)

15.8.5.4 FishMortBySpecAcc.FishMortBySpecAcc.on\_visibility ( *self*, *event*)

15.8.5.5 FishMortBySpecAcc.FishMortBySpecAcc.pop\_up ( *self*)

Help Window for Fishing Mortality in Special Access Area.

15.8.5.6 FishMortBySpecAcc.FishMortBySpecAcc.ReadFields ( *self*, *fName*)

Reads an Area file and returns the number of fields.

Fields have a Special Area number for the x value with a Mortality setting for the y value.

15.8.5.7 FishMortBySpecAcc.FishMortBySpecAcc.SaveFMFile ( *self*)

15.8.5.8 FishMortBySpecAcc.FishMortBySpecAcc.UpdateWidgets ( *self*)

## **15.8.6 Member Data Documentation**

- 15.8.6.1 FishMortBySpecAcc.FishMortBySpecAcc.areaMgr
- 15.8.6.2 FishMortBySpecAcc.FishMortBySpecAcc.EnterKeyClicked
- 15.8.6.3 FishMortBySpecAcc.FishMortBySpecAcc.fishMortFile
- 15.8.6.4 FishMortBySpecAcc.FishMortBySpecAcc.fishMortFileLabel
- 15.8.6.5 FishMortBySpecAcc.FishMortBySpecAcc.fmFName
- 15.8.6.6 FishMortBySpecAcc.FishMortBySpecAcc.numAreas
- 15.8.6.7 FishMortBySpecAcc.FishMortBySpecAcc.numDefined
- 15.8.6.8 FishMortBySpecAcc.FishMortBySpecAcc.numDefinedEntry
- 15.8.6.9 FishMortBySpecAcc.FishMortBySpecAcc.numDefinedLabel
- 15.8.6.10 FishMortBySpecAcc.FishMortBySpecAcc.numDefinedMax
- 15.8.6.11 FishMortBySpecAcc.FishMortBySpecAcc.numFieldsMax
- 15.8.6.12 FishMortBySpecAcc.FishMortBySpecAcc.numFieldss
- 15.8.6.13 FishMortBySpecAcc.FishMortBySpecAcc.on\_visibility
- 15.8.6.14 FishMortBySpecAcc.FishMortBySpecAcc.openFMFileButton
- 15.8.6.15 FishMortBySpecAcc.FishMortBySpecAcc.root
- 15.8.6.16 FishMortBySpecAcc.FishMortBySpecAcc.saveFMFileButton
- 15.8.6.17 FishMortBySpecAcc.FishMortBySpecAcc.startDir
- 15.8.6.18 FishMortBySpecAcc.FishMortBySpecAcc.yearEntry
- 15.8.6.19 The documentation for this class was generated from the following file:
- 15.8.6.20 FishMortBySpecAcc.py

## 15.9 ShapeTest.GeoShape Class Reference

### 15.9.1 Public Member Functions

- `__init__` (self)

### 15.9.2 Public Attributes

- `XY`
- `lat`
- `lon`
- `SAMS`
- `NewSAMS`
- `areaKm2`

### 15.9.3 Constructor & Destructor Documentation

15.9.3.1 ShapeTest.GeoShape.\_\_init\_\_ ( self)

### 15.9.4 Member Data Documentation

15.9.4.1 ShapeTest.GeoShape.areaKm2

15.9.4.2 ShapeTest.GeoShape.lat

15.9.4.3 ShapeTest.GeoShape.lon

15.9.4.4 ShapeTest.GeoShape.NewSAMS

15.9.4.5 ShapeTest.GeoShape.SAMS

15.9.4.6 ShapeTest.GeoShape.X

15.9.4.7 ShapeTest.GeoShape.Y

15.9.4.8 The documentation for this class was generated from the following file:

15.9.4.9 ShapeTest.py

## 15.10 SortByRegionFrame.GeoShape Class Reference

This class is used to define the shape of the regional data.

### 15.10.1 Public Member Functions

- `__init__` (self)

### 15.10.2 Public Attributes

- `XY`
- `lat`
- `lon`
- `Zone`
- `area`

### 15.10.3 Detailed Description

This class is used to define the shape of the regional data.

This class uses PyShp libraries as defined in <https://github.com/GeospatialPython/pyshp> ==> Code ==> Download ZIP

### 15.10.4 Constructor & Destructor Documentation

15.10.4.1 `SortByRegionFrame.GeoShape.__init__ ( self)`

### 15.10.5 Member Data Documentation

15.10.5.1 `SortByRegionFrame.GeoShape.area`

15.10.5.2 `SortByRegionFrame.GeoShape.lat`

15.10.5.3 `SortByRegionFrame.GeoShape.lon`

15.10.5.4 `SortByRegionFrame.GeoShape.X`

15.10.5.5 `SortByRegionFrame.GeoShape.Y`

15.10.5.6 `SortByRegionFrame.GeoShape.Zone`

15.10.5.7 The documentation for this class was generated from the following file:

15.10.5.8 `SortByRegionFrame.py`



## 15.11 SortIntoColumns.GeoShape Class Reference

### 15.11.1 Public Member Functions

- `__init__` (self)

### 15.11.2 Public Attributes

- `XY`
- `lat`
- `lon`
- `Region`

### 15.11.3 Constructor & Destructor Documentation

15.11.3.1 `SortIntoColumns.GeoShape.__init__ ( self)`

### 15.11.4 Member Data Documentation

15.11.4.1 `SortIntoColumns.GeoShape.lat`

15.11.4.2 `SortIntoColumns.GeoShape.lon`

15.11.4.3 `SortIntoColumns.GeoShape.Region`

15.11.4.4 `SortIntoColumns.GeoShape.X`

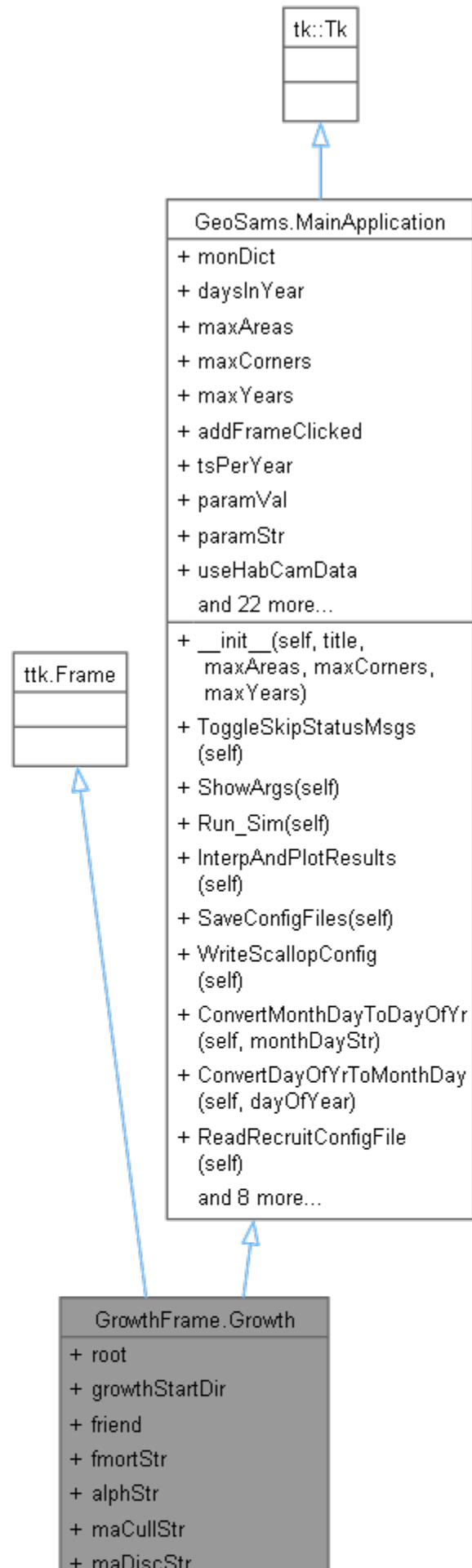
15.11.4.5 `SortIntoColumns.GeoShape.Y`

15.11.4.6 The documentation for this class was generated from the following file:

15.11.4.7 `SortIntoColumns.py`

## 15.12 GrowthFrame.Growth Class Reference

This class allows the user to adjust parameters used in computing scallop growth.  
Inheritance diagram for GrowthFrame.Growth:



### 15.12.1 Public Member Functions

- **\_\_init\_\_** (self, container, friend)  
*Constructor for Growth Class.*
- **on\_visibility** (self, event)
- **GetGrowthConfigFName** (self)  
*Calls the `filedialog` method `asksaveasfilename` to name a file to be used for the Mortality Configuration file.*
- **LoadGrowthData** (self)
- **UpdateWidgets** (self)
- **UpdateValues** (self)  
*Method to read Mortality Configuration file and set values accordingly.*
- **pop\_up** (self)

#### 15.12.1.1 Public Member Functions inherited from GeoSams.MainApplication

- **ToggleSkipStatusMsgs** (self)
- **ShowArgs** (self)  
*Display setup limits here Messagebox blocks entry widgets if attempted to open before the main window completes.*
- **Run\_Sim** (self)  
*Starts the GeoSAMS simulation **ScallopPopDensity** .*
- **InterpAndPlotResults** (self)
- **SaveConfigFiles** (self)  
*Save all of the defined configuration files.*
- **WriteScallopConfig** (self)  
*Saves simulation configuration file.*
- **ConvertMonthDayToDayOfYr** (self, monthDayStr)  
*This method is used to convert the recruitment start and stop dates from a string month numerical day into days in a year.*
- **ConvertDayOfYrToMonthDay** (self, dayOfYear)
- **ReadRecruitConfigFile** (self)  
*Read in the (tag, value) parameters from the recruitment to update parameters.*
- **WriteRecruitmentConfig** (self)  
*Saves recruitment parameters to a configuration file.*
- **WriteGrowthConfig** (self)

*Saves mortality parameters to a configuration file.*

- **WriteGridMgrConfig** (self)  
*Saves grid manager parameters to a configuration file.*
- **WriteSpatialFnCsConfig** (self, cfgFile, functions, numFnCsEntry)  
*Saves spatial function parameters to a configuration file.*
- **ReadConfigFile** (self, fName)  
*Reads a typical configuration file to recover the tags and values.*
- **ReadSimConfigFile** (self)  
*Read in the (tag, value) parameters from the simulation configuration file.*
- **ReadGridMgrConfigFile** (self)  
*Read in the (tag, value) parameters from the grid manager configuration file.*

### 15.12.2 Public Attributes

- rootgrowthStartDir
- friend
- fmortStr
- alphStr
- maCullStr
- maDiscStr
- gbCullStr
- gbDiscStr
- maFSelAStr
- maFSelBStr
- gbCIFSelAStr
- gbCIFSelBStr
- gbOpFSelAStr
- gbOpFSelBStr
- maAdultMortStr
- gbAdultMortStr
- maIncidStr
- gbIncidStr
- maLen0Str
- gbLen0Str
- fmortFileName
- lpueS1Str
- lpueS12Str
- lpueIntcStr
- maxPerDayStr
- maxTimeStr
- dredgeWdStr
- towSpdStr
- fishMort
- alphaMort

- **maAdultMort**
- **gbAdultMort**
- **maLength0**
- **gbLength0**
- **maFSelectA**
- **maFSelectB**
- **gbClosedFSelectA**
- **gbClosedFSelectB**
- **gbOpenFSelectA**
- **gbOpenFSelectB**
- **lpueSlope**
- **lpueSlope2**
- **lpueIntcept**
- **maxPerDay**
- **maxTime**
- **dredgeWth**
- **towSpeed**
- **maIncident**
- **gbIncident**
- **maCullSize**
- **maDiscard**
- **gbCullSize**
- **gbDiscard**
- **growthCfgFile**
- **saveGrowthConfigButton**
- **loadGrowthConfigButton**
- **on\_visibility**

#### 15.12.2.1 Public Attributes inherited from GeoSams.MainApplication

- **monDict**
- **daysInYear**
- **maxAreas**
- **maxCorners**
- **maxYears**
- **addFrameClicked**
- **tsPerYear**
- **paramVal**
- **paramStr**
- **useHabCamData**
- **domainName**
- **yearStart**
- **yearStop**
- **simConfigFile**
- **style**
- **root**
- **notebook**
- **frame1**
- **recrConfigFile**
- **frame2**
- **frame3**
- **frame5**
- **frame6**

- **frame7**
- **frame8**
- **gmConfigFile**
- **specAccFileStr**
- **isSkip**
- **skipStatusMsgs**
- **skipStatusMsgsRB**
- **recruitYrStrt**
- **recruitYrStop**

### 15.12.3 Detailed Description

This class allows the user to adjust parameters used in computing scallop growth.

### 15.12.4 Constructor & Destructor Documentation

#### 15.12.4.1 GrowthFrame.Growth.\_\_init\_\_( *self*, *container*, *friend*)

Constructor for Growth Class.

Reimplemented from **GeoSams.MainApplication** (p.69).

### 15.12.5 Member Function Documentation

#### 15.12.5.1 GrowthFrame.Growth.GetGrowthConfigFName ( *self*)

Calls the filedialog method asksaveasfilename to name a file to be used for the Mortality Configuration file.

It then writes out the defined parameters to this file using the 'tag = value' format.

#### 15.12.5.2 GrowthFrame.Growth.LoadGrowthData ( *self*)

#### 15.12.5.3 GrowthFrame.Growth.on\_visibility ( *self*, *event*)

#### 15.12.5.4 GrowthFrame.Growth.pop\_up ( *self*)

Reimplemented from **GeoSams.MainApplication** (p.70).

#### 15.12.5.5 GrowthFrame.Growth.UpdateValues ( *self*)

Method to read Mortality Configuration file and set values accordingly.

#### 15.12.5.6 GrowthFrame.Growth.UpdateWidgets ( *self*)

## **15.12.6 Member Data Documentation**

- 15.12.6.1 GrowthFrame.Growth.alphaMort
- 15.12.6.2 GrowthFrame.Growth.alphStr
- 15.12.6.3 GrowthFrame.Growth.dredgeWdStr
- 15.12.6.4 GrowthFrame.Growth.dredgeWth
- 15.12.6.5 GrowthFrame.Growth.fishMort
- 15.12.6.6 GrowthFrame.Growth.fmortFileName
- 15.12.6.7 GrowthFrame.Growth.fmortStr
- 15.12.6.8 GrowthFrame.Growth.friend
- 15.12.6.9 GrowthFrame.Growth.gbAdultMort
- 15.12.6.10 GrowthFrame.Growth.gbAdultMortStr
- 15.12.6.11 GrowthFrame.Growth.gbCIFSelAStr
- 15.12.6.12 GrowthFrame.Growth.gbCIFSelBStr
- 15.12.6.13 GrowthFrame.Growth.gbClosedFSelectA
- 15.12.6.14 GrowthFrame.Growth.gbClosedFSelectB
- 15.12.6.15 GrowthFrame.Growth.gbCullSize
- 15.12.6.16 GrowthFrame.Growth.gbCullStr
- 15.12.6.17 GrowthFrame.Growth.gbDiscard
- 15.12.6.18 GrowthFrame.Growth.gbDiscStr
- 15.12.6.19 GrowthFrame.Growth.gbIncident
- 15.12.6.20 GrowthFrame.Growth.gbIncidStr
- 15.12.6.21 GrowthFrame.Growth.gbLen0Str
- 15.12.6.22 GrowthFrame.Growth.gbLength0
- 15.12.6.23 GrowthFrame.Growth.gbOpenFSelectA



15.12.6.24 GrowthFrame.Growth.gbOpenFSelectB  
15.12.6.25 GrowthFrame.Growth.gbOpFSelAStr  
15.12.6.26 GrowthFrame.Growth.gbOpFSelBStr  
15.12.6.27 GrowthFrame.Growth.growthCfgFile  
15.12.6.28 GrowthFrame.Growth.growthStartDir  
15.12.6.29 GrowthFrame.Growth.loadGrowthConfigButton  
15.12.6.30 GrowthFrame.Growth.lpueIntcept  
15.12.6.31 GrowthFrame.Growth.lpueIntcStr  
15.12.6.32 GrowthFrame.Growth.lpueSI2Str  
15.12.6.33 GrowthFrame.Growth.lpueSlope  
15.12.6.34 GrowthFrame.Growth.lpueSlope2  
15.12.6.35 GrowthFrame.Growth.lpueSIStr  
15.12.6.36 GrowthFrame.Growth.maAdultMort  
15.12.6.37 GrowthFrame.Growth.maAdultMortStr  
15.12.6.38 GrowthFrame.Growth.maCullSize  
15.12.6.39 GrowthFrame.Growth.maCullStr  
15.12.6.40 GrowthFrame.Growth.maDiscard  
15.12.6.41 GrowthFrame.Growth.maDiscStr  
15.12.6.42 GrowthFrame.Growth.maFSelAStr  
15.12.6.43 GrowthFrame.Growth.maFSelBStr  
15.12.6.44 GrowthFrame.Growth.maFSelectA  
15.12.6.45 GrowthFrame.Growth.maFSelectB  
15.12.6.46 GrowthFrame.Growth.maIncident  
15.12.6.47 GrowthFrame.Growth.maIncidStr  
15.12.6.48 GrowthFrame.Growth.maLen0Str

15.12.6.49 GrowthFrame.Growth.maLength0

15.12.6.50 GrowthFrame.Growth.maxPerDay

15.12.6.51 GrowthFrame.Growth.maxPerDayStr

15.12.6.52 GrowthFrame.Growth.maxTime

15.12.6.53 GrowthFrame.Growth.maxTimeStr

15.12.6.54 GrowthFrame.Growth.on\_visibility

15.12.6.55 GrowthFrame.Growth.root

15.12.6.56 GrowthFrame.Growth.saveGrowthConfigButton

15.12.6.57 GrowthFrame.Growth.towSpdStr

15.12.6.58 GrowthFrame.Growth.towSpeed

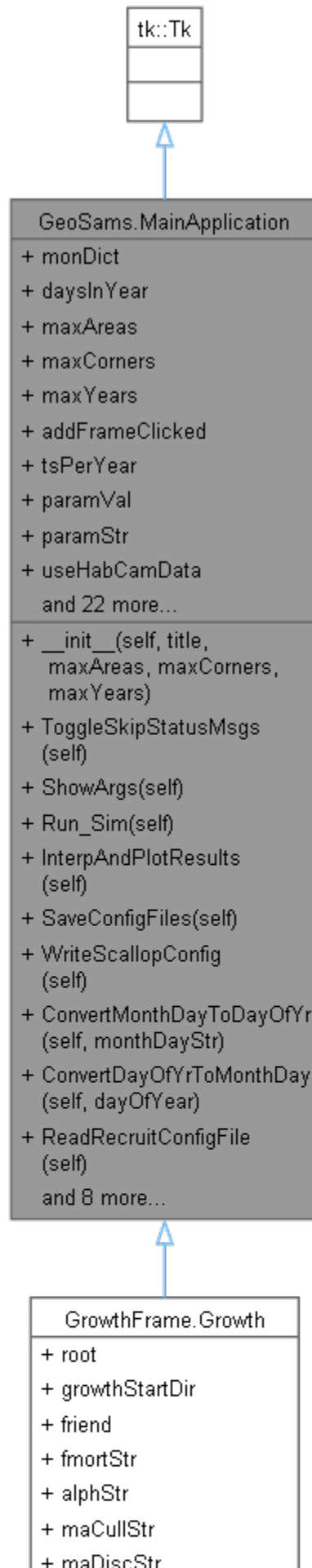
15.12.6.59 The documentation for this class was generated from the following file:

15.12.6.60 GrowthFrame.py

## 15.13 GeoSams.MainApplication Class Reference

This class is the parent class for the GUI.

Inheritance diagram for GeoSams.MainApplication:



### 15.13.1 Public Member Functions

- **\_\_init\_\_** (self, title, maxAreas, maxCorners, maxYears)
  - **ToggleSkipStatusMsgs** (self)
  - **ShowArgs** (self)  
*Display setup limits here Messagebox blocks entry widgets if attempted to open before the main window completes.*
- **Run\_Sim** (self)  
*Starts the GeoSAMS simulatation **ScallopPopDensity** .*
- **InterpAndPlotResults** (self)
- **SaveConfigFiles** (self)  
*Save all of the defined configuration files.*
- **WriteScallopConfig** (self)  
*Saves simulation configuration file.*
- **ConvertMonthDayToDayOfYr** (self, monthDayStr)  
*This method is used to converty the recruitment start and stop dates from a string month numerical day into days in a year.*
- **ConvertDayOfYrToMonthDay** (self, dayOfYear)
- **ReadRecruitConfigFile** (self)  
*Read in the (tag, value) parameters from the recruitment to update parameters.*
- **WriteRecruitmentConfig** (self)  
*Saves recruitment parameters to a configuration file.*
- **WriteGrowthConfig** (self)  
*Saves mortality parameters to a configuration file.*
- **WriteGridMgrConfig** (self)  
*Saves grid manager parameters to a configuration file.*
- **WriteSpatialFnCsConfig** (self, cfgFile, functions, numFnCsEntry)  
*Saves spatial function parameters to a configuration file.*
- **ReadConfigFile** (self, fName)  
*Reads a typical configuration file to recover the tags and values.*
- **ReadSimConfigFile** (self)  
*Read in the (tag, value) parameters from the simulation configuration file.*

- **ReadGridMgrConfigFile** (self)  
*Read in the (tag, value) parameters from the grid manager configuration file.*
- **pop\_up** (self)

### 15.13.2 Public Attributes

- **monDictdaysInYear**
- **maxAreas**
- **maxCorners**
- **maxYears**
- **addFrameClicked**
- **tsPerYear**
- **paramVal**
- **paramStr**
- **useHabCamData**
- **domainName**
- **yearStart**
- **yearStop**
- **simConfigFile**
- **style**
- **root**
- **notebook**
- **frame1**
- **reerConfigFile**
- **frame2**
- **frame3**
- **frame5**
- **frame6**
- **frame7**
- **frame8**
- **gmConfigFile**
- **specAccFileStr**
- **isSkip**
- **skipStatusMsgs**
- **skipStatusMsgsRB**
- **recruitYrStrt**
- **recruitYrStop**

### 15.13.3 Detailed Description

This class is the parent class for the GUI.

### 15.13.4 Constructor & Destructor Documentation

15.13.4.1 **GeoSams.MainApplication.\_\_init\_\_** ( self, title, maxAreas, maxCorners, maxYears)

Reimplemented in **GrowthFrame.Growth** (p.62).

## 15.13.5 Member Function Documentation

15.13.5.1 GeoSams.MainApplication.ConvertDayOfYrToMonthDay ( *self*, *dayOfYear*)

15.13.5.2 GeoSams.MainApplication.ConvertMonthDayToDayOfYr ( *self*, *monthDayStr*)

This method is used to convert the recruitment start and stop dates from a string month numerical day into days in a year.

Changed entry to combo box to guarantee format

### 15.13.5.2.1Parameters

<i>monthDayStr</i>	string that holds month and day in alpha format. That is 'JAN 01'
--------------------	---

The Growth year starts on June 1st, actually May 31 at 2400 Jun 1st @ 0600 is day 0.25 which is  $= 0.25 / 365.2425 = 0.00068$  years June 1st @ 1200 is day 0.50 which is  $= 0.50 / 365.2425 = 0.00137$

June 1st @ 1800 is day 0.75 which is  $= 0.75 / 365.2425 = 0.00205$

June 1st @ 2359 is day 0.99 which is  $= 0.99931 / 365.2425 = 0.002736$

Jun2 2nd @ 0000 is day 1 which is  $= 1.00000 / 365.2425 = 0.00274$

Jun2 2nd @ 2400 is day 2 which is  $= 2.00000 / 365.2425 = 0.00548$

Dec 31st @ 2400 is day 214 which is  $= 214. / 365.2425 = 0.58591$

Jan 1st @ 2400 is day 215 which is  $= 215. / 365.2425 = 0.58865$

$= 1 + \text{DayOfYear}(12,31) - \text{DayOfYear}(5,31)$  Apr 10 @ 2400 is day 314 which is  $= 314. / 365.2425 = 0.85970$

if leap year 315 which is  $= 315. / 365.2425 = 0.86244$  However, leap year is handled in the main loop in which it is considered only for the current year

15.13.5.3 GeoSams.MainApplication.InterpAndPlotResults ( *self*)

15.13.5.4 GeoSams.MainApplication.pop\_up ( *self*)

Reimplemented in **GrowthFrame.Growth** (p.62).

15.13.5.5 GeoSams.MainApplication.ReadConfigFile ( *self*, *fName*)

Reads a typical configuration file to recover the tags and values.

The parameters in these files all have the following format:

- # indicates that the line is a comment. Otherwise
- 'tag' = 'value'

### 15.13.5.5.1Parameters

<i>fName</i>	The name of the file to read.
--------------	-------------------------------

### 15.13.5.5.2Returns

An array of tuples showing (tag, value) found in the file

#### 15.13.5.6 GeoSams.MainApplication.ReadGridMgrConfigFile ( *self*)

Read in the (tag, value) parameters from the grid manager configuration file.

#### 15.13.5.7 GeoSams.MainApplication.ReadRecruitConfigFile ( *self*)

Read in the (tag, value) parameters from the recruitment to update parameters.

#### 15.13.5.8 GeoSams.MainApplication.ReadSimConfigFile ( *self*)

Read in the (tag, value) parameters from the simulation configuration file.

#### 15.13.5.9 GeoSams.MainApplication.Run\_Sim ( *self*)

Starts the GeoSAMS simulation **ScallopPopDensity** .

1a) TrawlData5mmbin(Year, 'DN') this will Delete bin5mm2022AL.csv INPUT:  
OriginalData\dredgetowbysize7917.csv OUTPUT: Data\bin5mm<yyyy><dn>.csv

#### 15.13.5.10 GeoSams.MainApplication.SaveConfigFiles ( *self*)

Save all of the defined configuration files.

#### 15.13.5.11 GeoSams.MainApplication.ShowArgs ( *self*)

Display setup limits here MessageBox blocks entry widgets if attempted to open before the main window completes.

#### 15.13.5.12 GeoSams.MainApplication.ToggleSkipStatusMsgs ( *self*)

#### 15.13.5.13 GeoSams.MainApplication.WriteGridMgrConfig ( *self*)

Saves grid manager parameters to a configuration file.

#### 15.13.5.14 GeoSams.MainApplication.WriteGrowthConfig ( *self*)

Saves mortality parameters to a configuration file.

#### 15.13.5.15 GeoSams.MainApplication.WriteRecruitmentConfig ( *self*)

Saves recruitment parameters to a configuration file.

#### 15.13.5.16 GeoSams.MainApplication.WriteScallopConfig ( *self*)

Saves simulation configuration file.



It does so by writeing the parameters for the to the name file as well as keeping helpfule comments.

15.13.5.17 GeoSams.MainApplication.WriteSpatialFncsConfig ( *self*, *cfgFile*, *functions*,  
*numFncsEntry*)

Saves spatial function parameters to a configuration file.

## **15.13.6 Member Data Documentation**

- 15.13.6.1 GeoSams.MainApplication.addFrameClicked
- 15.13.6.2 GeoSams.MainApplication.daysInYear
- 15.13.6.3 GeoSams.MainApplication.domainName
- 15.13.6.4 GeoSams.MainApplication.frame1
- 15.13.6.5 GeoSams.MainApplication.frame2
- 15.13.6.6 GeoSams.MainApplication.frame3
- 15.13.6.7 GeoSams.MainApplication.frame5
- 15.13.6.8 GeoSams.MainApplication.frame6
- 15.13.6.9 GeoSams.MainApplication.frame7
- 15.13.6.10 GeoSams.MainApplication.frame8
- 15.13.6.11 GeoSams.MainApplication.gmConfigFile
- 15.13.6.12 GeoSams.MainApplication.isSkip
- 15.13.6.13 GeoSams.MainApplication.maxAreas
- 15.13.6.14 GeoSams.MainApplication.maxCorners
- 15.13.6.15 GeoSams.MainApplication.maxYears
- 15.13.6.16 GeoSams.MainApplication.monDict
- 15.13.6.17 GeoSams.MainApplication.notebook
- 15.13.6.18 GeoSams.MainApplication.paramStr
- 15.13.6.19 GeoSams.MainApplication.paramVal
- 15.13.6.20 GeoSams.MainApplication.recrConfigFile
- 15.13.6.21 GeoSams.MainApplication.recruitYrStop
- 15.13.6.22 GeoSams.MainApplication.recruitYrStrt
- 15.13.6.23 GeoSams.MainApplication.root

15.13.6.24 GeoSams.MainApplication.simConfigFile

15.13.6.25 GeoSams.MainApplication.skipStatusMsgs

15.13.6.26 GeoSams.MainApplication.skipStatusMsgsRB

15.13.6.27 GeoSams.MainApplication.specAccFileStr

15.13.6.28 GeoSams.MainApplication.style

15.13.6.29 GeoSams.MainApplication.tsPerYear

15.13.6.30 GeoSams.MainApplication.useHabCamData

15.13.6.31 GeoSams.MainApplication.yearStart

15.13.6.32 GeoSams.MainApplication.yearStop

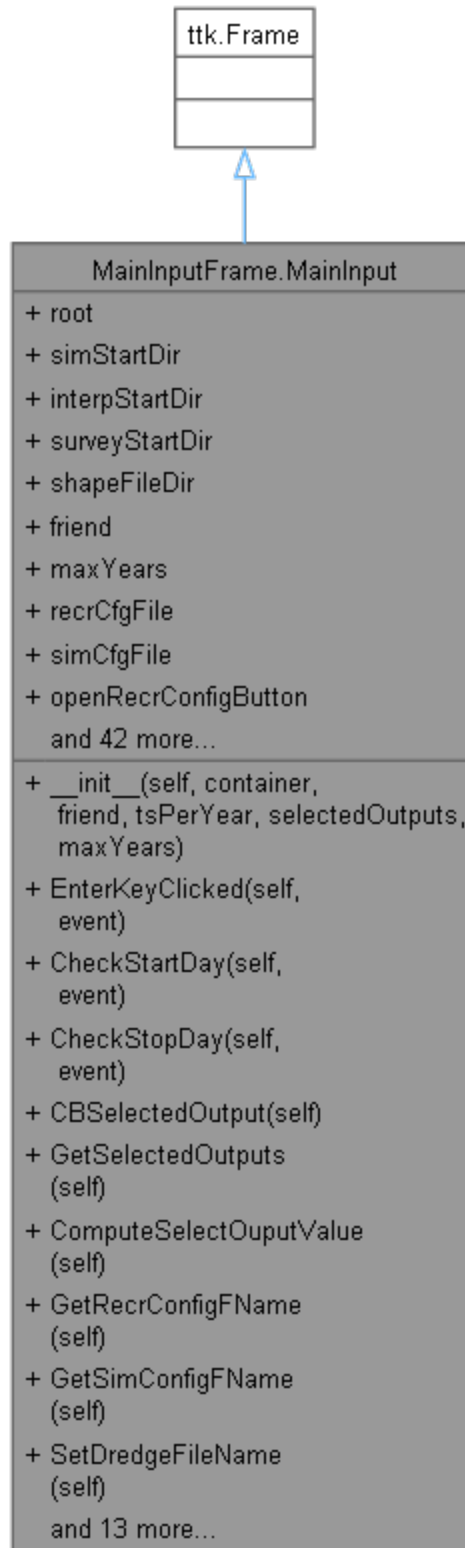
15.13.6.33 The documentation for this class was generated from the following file:

15.13.6.34 GeoSams.py

## 15.14 MainInputFrame.MainInput Class Reference

This class displays information about GeoSAMS simulation.

Inheritance diagram for MainInputFrame.MainInput:



### 15.14.1 Public Member Functions

- `__init__(self, container, friend, tsPerYear, selectedOutputs, maxYears)`

- **EnterKeyClicked** (self, event)  
*This method is called on both Enter Key clicked and goes out of focus.*
- **CheckStartDay** (self, event)  
*Checks start day to validate date is appropriate for month.*
- **CheckStopDay** (self, event)  
*Checks stop day to validate date is appropriate for month.*
- **CBSelectedOutput** (self)  
*Determines the value for which outputs are selected as they are checked.*
- **GetSelectedOutputs** (self)  
*Updates the final value from which outputs are selected.*
- **ComputeSelectOutputValue** (self)  
*Bit shifts (multiplies) checkboxes and computes bit position value.*
- **GetRecrConfigFName** (self)  
*Calls the filedialog method asksaveasfilename to name a file to be used for the Recruitment Configuration file.*
- **GetSimConfigFName** (self)  
*Calls the filedialog method asksaveasfilename to name a file to be used for the Simulation Configuration file.*
- **SetDredgeFileName** (self)
- **SetDredgeFileEnvVar** (self)
- **SetHabCamFileName** (self)
- **SetHabCamFileEnvVar** (self)
- **OpenPDF** (self)
- **SetMaShapeFile** (self)
- **SetMaShapeFileEnvVar** (self)
- **SetGbShapeFile** (self)
- **SetGBShapeFileEnvVar** (self)
- **SetMaShapeBufferFile** (self)
- **SetMaShapeBufferFileEnvVar** (self)
- **SetGbShapeBufferFile** (self)
- **SetGBShapeBufferFileEnvVar** (self)
- **pop\_up** (self)

### 15.14.2 Public Attributes

- **rootsimStartDir**
- **interpStartDir**
- **surveyStartDir**
- **shapeFileDir**
- **friend**

- **maxYears**
- **recrCfgFile**
- **simCfgFile**
- **openRecrConfigButton**
- **openSimConfigButton**
- **openPDFButton**
- **dredgeDataFile**
- **habCamDataFile**
- **setDredgeDataButton**
- **setHabCamDataButton**
- **maShapeFileEntry**
- **gbShapeFileEntry**
- **maShapeBufferFileEntry**
- **gbShapeBufferFileEntry**
- **setMaShapeFileButton**
- **setGbShapeFileButton**
- **setMaShapeBufferFileButton**
- **setGbShapeBufferFileButton**
- **monthsArr**
- **startDayLabel**
- **startDayComboMonth**
- **CheckStartDay**
- **startDayComboDay**
- **stopDayLabel**
- **stopDayComboMonth**
- **CheckStopDay**
- **stopDayComboDay**
- **recrYrStrt**
- **recrYrStop**
- **numYrsAvg**
- **startYr**
- **stopYr**
- **tsPerYear**
- **domainNameLabel**
- **domainNameCombo**
- **lpueVar**
- **ebmsVar**
- **bmsVar**
- **abunVar**
- **lndwVar**
- **landVar**
- **feffVar**
- **fmortVar**
- **recrVar**
- **desiredOutput**
- **areaFName**

### **15.14.3 Detailed Description**

This class displays information about GeoSAMS simulation.

This same information is used on the command line when starting SRC\ScallopPopDensity

## 15.14.4 Constructor & Destructor Documentation

15.14.4.1 `MainInputFrame.MainInput.__init__ ( self, container, friend, tsPerYear, selectedOutputs, maxYears)`

## 15.14.5 Member Function Documentation

15.14.5.1 `MainInputFrame.MainInput.CBSelectedOutput ( self)`

Determines the value for which outputs are selected as they are checked.

15.14.5.2 `MainInputFrame.MainInput.CheckStartDay ( self, event)`

Checks start day to validate date is appropriate for month.

Does not consider if leap year

15.14.5.3 `MainInputFrame.MainInput.CheckStopDay ( self, event)`

Checks stop day to validate date is appropriate for month.

Does not consider if leap year

15.14.5.4 `MainInputFrame.MainInput.ComputeSelectOutputValue ( self)`

Bit shifts (multiplies) checkbuttons and computes bit position value.

15.14.5.5 `MainInputFrame.MainInput.EnterKeyClicked ( self, event)`

This method is called on both Enter Key clicked and goes out of focus.

15.14.5.6 `MainInputFrame.MainInput.GetRecrConfigFName ( self)`

Calls the `filedialog` method `asksaveasfilename` to name a file to be used for the Recruitment Configuration file.

It then writes out the defined parameters to this file using the 'tag = value' format.

15.14.5.7 `MainInputFrame.MainInput.GetSelectedOutputs ( self)`

Updates the final value from which outputs are selected.

15.14.5.8 `MainInputFrame.MainInput.GetSimConfigFName ( self)`



Calls the `filedialog` method `asksaveasfilename` to name a file to be used for the Simulation Configuration file.

It then writes out the defined parameters to this file using the 'tag = value' format.

15.14.5.9 `MainInputFrame.MainInput.OpenPDF ( self)`

15.14.5.10 `MainInputFrame.MainInput.pop_up ( self)`

15.14.5.11 `MainInputFrame.MainInput.SetDredgeFileEnvVar ( self)`

15.14.5.12 `MainInputFrame.MainInput.SetDredgeFileName ( self)`

15.14.5.13 `MainInputFrame.MainInput.SetGbShapeBufferFile ( self)`

15.14.5.14 `MainInputFrame.MainInput.SetGBShapeBufferFileEnvVar ( self)`

15.14.5.15 `MainInputFrame.MainInput.SetGbShapeFile ( self)`

15.14.5.16 `MainInputFrame.MainInput.SetGBShapeFileEnvVar ( self)`

15.14.5.17 `MainInputFrame.MainInput.SetHabCamFileEnvVar ( self)`

15.14.5.18 `MainInputFrame.MainInput.SetHabCamFileName ( self)`

15.14.5.19 `MainInputFrame.MainInput.SetMaShapeBufferFile ( self)`

15.14.5.20 `MainInputFrame.MainInput.SetMaShapeBufferFileEnvVar ( self)`

15.14.5.21 `MainInputFrame.MainInput.SetMaShapeFile ( self)`

15.14.5.22 `MainInputFrame.MainInput.SetMaShapeFileEnvVar ( self)`

## **15.14.6 Member Data Documentation**

- 15.14.6.1 MainInputFrame.MainInput.abunVar
- 15.14.6.2 MainInputFrame.MainInput.areaFName
- 15.14.6.3 MainInputFrame.MainInput.bmsVar
- 15.14.6.4 MainInputFrame.MainInput.CheckStartDay
- 15.14.6.5 MainInputFrame.MainInput.CheckStopDay
- 15.14.6.6 MainInputFrame.MainInput.desiredOutput
- 15.14.6.7 MainInputFrame.MainInput.domainNameCombo
- 15.14.6.8 MainInputFrame.MainInput.domainNameLabel
- 15.14.6.9 MainInputFrame.MainInput.dredgeDataFile
- 15.14.6.10 MainInputFrame.MainInput.ebmsVar
- 15.14.6.11 MainInputFrame.MainInput.feffVar
- 15.14.6.12 MainInputFrame.MainInput.fmortVar
- 15.14.6.13 MainInputFrame.MainInput.friend
- 15.14.6.14 MainInputFrame.MainInput.gbShapeBufferFileEntry
- 15.14.6.15 MainInputFrame.MainInput.gbShapeFileEntry
- 15.14.6.16 MainInputFrame.MainInput.habCamDataFile
- 15.14.6.17 MainInputFrame.MainInput.interpStartDir
- 15.14.6.18 MainInputFrame.MainInput.landVar
- 15.14.6.19 MainInputFrame.MainInput.lndwVar
- 15.14.6.20 MainInputFrame.MainInput.lpueVar
- 15.14.6.21 MainInputFrame.MainInput.maShapeBufferFileEntry
- 15.14.6.22 MainInputFrame.MainInput.maShapeFileEntry
- 15.14.6.23 MainInputFrame.MainInput.maxYears

15.14.6.24 MainInputFrame.MainInput.monthsArr

15.14.6.25 MainInputFrame.MainInput.numYrsAvg

15.14.6.26 MainInputFrame.MainInput.openPDFButton

15.14.6.27 MainInputFrame.MainInput.openRecrConfigButton

15.14.6.28 MainInputFrame.MainInput.openSimConfigButton

15.14.6.29 MainInputFrame.MainInput.recrCfgFile

15.14.6.30 MainInputFrame.MainInput.recrVar

15.14.6.31 MainInputFrame.MainInput.recrYrStop

15.14.6.32 MainInputFrame.MainInput.recrYrStrt

15.14.6.33 MainInputFrame.MainInput.root

15.14.6.34 MainInputFrame.MainInput.setDredgeDataButton

15.14.6.35 MainInputFrame.MainInput.setGbShapeBufferFileButton

15.14.6.36 MainInputFrame.MainInput.setGbShapeFileButton

15.14.6.37 MainInputFrame.MainInput.setHabCamDataButton

15.14.6.38 MainInputFrame.MainInput.setMaShapeBufferFileButton

15.14.6.39 MainInputFrame.MainInput.setMaShapeFileButton

15.14.6.40 MainInputFrame.MainInput.shapeFileDir

15.14.6.41 MainInputFrame.MainInput.simCfgFile

15.14.6.42 MainInputFrame.MainInput.simStartDir

15.14.6.43 MainInputFrame.MainInput.startDayComboDay

15.14.6.44 MainInputFrame.MainInput.startDayComboMonth

15.14.6.45 MainInputFrame.MainInput.startDayLabel

15.14.6.46 MainInputFrame.MainInput.startYr

15.14.6.47 MainInputFrame.MainInput.stopDayComboDay

15.14.6.48 MainInputFrame.MainInput.stopDayComboMonth

15.14.6.49 MainInputFrame.MainInput.stopDayLabel

15.14.6.50 MainInputFrame.MainInput.stopYr

15.14.6.51 MainInputFrame.MainInput.surveyStartDir

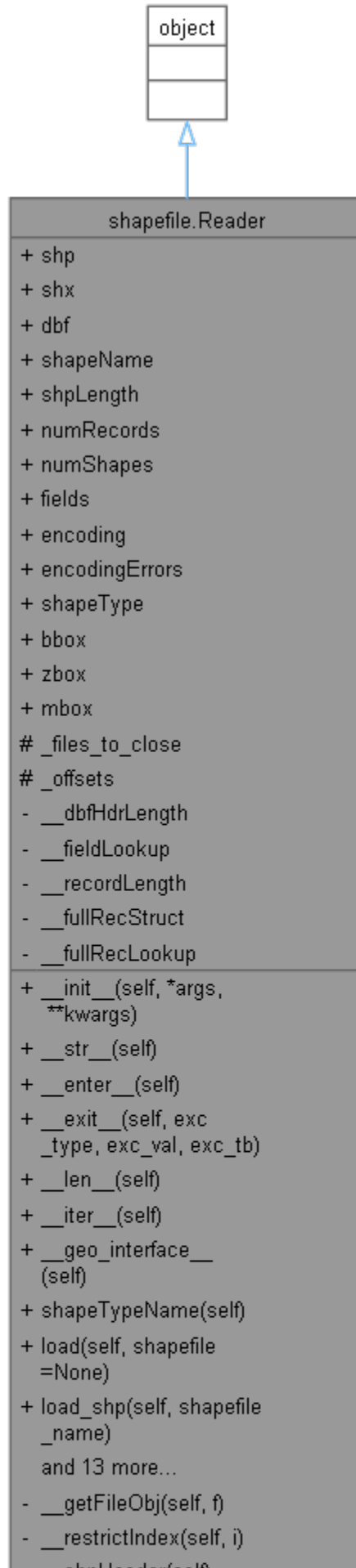
15.14.6.52 MainInputFrame.MainInput.tsPerYear

15.14.6.53 The documentation for this class was generated from the following file:

15.14.6.54 MainInputFrame.py

## 15.15 shapefile.Reader Class Reference

Inheritance diagram for shapefile.Reader:



### 15.15.1 Public Member Functions

- `__init__` (self, \*args, \*\*kwargs)
- `__str__` (self)
- `__enter__` (self)
- `__exit__` (self, exc\_type, exc\_val, exc\_tb)
- `__len__` (self)
- `__iter__` (self)
- `__geo_interface__` (self)
- `shapeTypeName` (self)
- `load` (self, shapefile=None)
- `load_shp` (self, shapefile\_name)
- `load_shx` (self, shapefile\_name)
- `load_dbf` (self, shapefile\_name)
- `__del__` (self)
- `close` (self)
- `shape` (self, i=0, bbox=None)
- `shapes` (self, bbox=None)
- `iterShapes` (self, bbox=None)
- `record` (self, i=0, fields=None)
- `records` (self, fields=None)
- `iterRecords` (self, fields=None)
- `shapeRecord` (self, i=0, fields=None, bbox=None)
- `shapeRecords` (self, fields=None, bbox=None)
- `iterShapeRecords` (self, fields=None, bbox=None)

### 15.15.2 Public Attributes

- `shps`
- `dbf`
- `shapeName`
- `shpLength`
- `numRecords`
- `numShapes`
- `fields`
- `encoding`
- `encodingErrors`
- `shapeType`
- `bbox`
- `zbox`
- `mbox`

### 15.15.3 Protected Attributes

- `__files_to_close_offsets`

### 15.15.4 Private Member Functions

- `__getFileObj` (self, f)
- `__restrictIndex` (self, i)
- `__shpHeader` (self)
- `__shape` (self, oid=None, bbox=None)
- `__shxHeader` (self)
- `__shxOffsets` (self)
- `__shapeIndex` (self, i=None)

- `__dbfHeader` (self)
- `__recordFmt` (self, fields=None)
- `__recordFields` (self, fields=None)
- `__record` (self, fieldTuples, recLookup, recStruct, oid=None)

### 15.15.5 Private Attributes

- `__dbfHdrLength__fieldLookup`
- `__recordLength`
- `__fullRecStruct`
- `__fullRecLookup`

### 15.15.6 Detailed Description

Reads the three files of a shapefile as a unit or separately. If one of the three files (.shp, .shx, .dbf) is missing no exception is thrown until you try to call a method that depends on that particular file. The .shx index file is used if available for efficiency but is not required to read the geometry from the .shp file. The "shapefile" argument in the constructor is the name of the file you want to open, and can be the path to a shapefile on a local filesystem, inside a zipfile, or a url.

You can instantiate a Reader without specifying a shapefile and then specify one later with the `load()` method.

Only the shapefile headers are read upon loading. Content within each file is only accessed when required and as efficiently as possible. Shapefiles are usually not large but they can be.

### 15.15.7 Constructor & Destructor Documentation

15.15.7.1 `shapefile.Reader.__init__ ( self, * args, ** kwargs)`

15.15.7.2 `shapefile.Reader.__del__ ( self)`

### 15.15.8 Member Function Documentation

15.15.8.1 `shapefile.Reader.__dbfHeader ( self)[private]`

Reads a dbf header. Xbase-related code borrows heavily from ActiveState Python Cookbook Recipe 362715 by Raymond Hettinger

15.15.8.2 `shapefile.Reader.__enter__ ( self)`

Enter phase of context manager.



#### 15.15.8.3 `shapefile.Reader.__exit__( self, exc_type, exc_val, exc_tb)`

Exit phase of context manager, close opened files.

#### 15.15.8.4 `shapefile.Reader.__geo_interface__( self)`

#### 15.15.8.5 `shapefile.Reader.__getFileObj( self, f)[private]`

Checks to see if the requested shapefile file object is available. If not a `ShapefileException` is raised.

#### 15.15.8.6 `shapefile.Reader.__iter__( self)`

Iterates through the shapes/records in the shapefile.

#### 15.15.8.7 `shapefile.Reader.__len__( self)`

Returns the number of shapes/records in the shapefile.

#### 15.15.8.8 `shapefile.Reader.__record( self, fieldTuples, recLookup, recStruct, oid = None)[private]`

Reads and returns a dbf record row as a list of values. Requires specifying a list of field info tuples 'fieldTuples', a record name-index dict 'recLookup', and a Struct instance 'recStruct' for unpacking these fields.

#### 15.15.8.9 `shapefile.Reader.__recordFields( self, fields = None)[private]`

Returns the necessary info required to unpack a record's fields, restricted to a subset of fieldnames 'fields' if specified. Returns a list of field info tuples, a name-index lookup dict, and a Struct instance for unpacking these fields. Note that `DeletionFlag` is not a valid field.

#### 15.15.8.10 `shapefile.Reader.__recordFmt( self, fields = None)[private]`

Calculates the format and size of a .dbf record. Optional 'fields' arg specifies which fieldnames to unpack and which to ignore. Note that this always includes the `DeletionFlag` at index 0, regardless of the 'fields' arg.

#### 15.15.8.11 `shapefile.Reader.__restrictIndex( self, i)[private]`

Provides list-like handling of a record index with a clearer error message if the index is out of bounds.

15.15.8.12 `shapefile.Reader.__shape ( self, oid = None, bbox = None)[private]`

Returns the header info and geometry for a single shape.

15.15.8.13 `shapefile.Reader.__shapexIndex ( self, i = None)[private]`

Returns the offset in a .shp file for a shape based on information in the .shx index file.

15.15.8.14 `shapefile.Reader.__shpHeader ( self)[private]`

Reads the header information from a .shp file.

15.15.8.15 `shapefile.Reader.__shxHeader ( self)[private]`

Reads the header information from a .shx file.

15.15.8.16 `shapefile.Reader.__shxOffsets ( self)[private]`

Reads the shape offset positions from a .shx file

15.15.8.17 `shapefile.Reader.__str__ ( self)`

Use some general info on the shapefile as `__str__`

15.15.8.18 `shapefile.Reader.close ( self)`

15.15.8.19 `shapefile.Reader.iterRecords ( self, fields = None)`

Returns a generator of records in a dbf file.  
Useful for large shapefiles or dbf files.  
To only read some of the fields, specify the 'fields' arg as a list of one or more fieldnames.

15.15.8.20 `shapefile.Reader.iterShapeRecords ( self, fields = None, bbox = None)`

Returns a generator of combination geometry/attribute records for all records in a shapefile.  
To only read some of the fields, specify the 'fields' arg as a list of one or more fieldnames.  
To only read entries within a given spatial region, specify the 'bbox' arg as a list or tuple of xmin,ymin,xmax,ymax.

#### 15.15.8.21 shapefile.Reader.iterShapes ( *self*, *bbox* = None)

Returns a generator of shapes in a shapefile. Useful for handling large shapefiles.  
To only read shapes within a given spatial region, specify the 'bbox' arg as a list or tuple of xmin,ymin,xmax,ymax.

#### 15.15.8.22 shapefile.Reader.load ( *self*, *shapefile* = None)

Opens a shapefile from a filename or file-like object. Normally this method would be called by the constructor with the file name as an argument.

#### 15.15.8.23 shapefile.Reader.load\_dbf ( *self*, *shapefile\_name*)

Attempts to load file with .dbf extension as both lower and upper case

#### 15.15.8.24 shapefile.Reader.load\_shp ( *self*, *shapefile\_name*)

Attempts to load file with .shp extension as both lower and upper case

#### 15.15.8.25 shapefile.Reader.load\_shx ( *self*, *shapefile\_name*)

Attempts to load file with .shx extension as both lower and upper case

#### 15.15.8.26 shapefile.Reader.record ( *self*, *i* = 0, *fields* = None)

Returns a specific dbf record based on the supplied index.  
To only read some of the fields, specify the 'fields' arg as a list of one or more fieldnames.

#### 15.15.8.27 shapefile.Reader.records ( *self*, *fields* = None)

Returns all records in a dbf file.  
To only read some of the fields, specify the 'fields' arg as a list of one or more fieldnames.

#### 15.15.8.28 shapefile.Reader.shape ( *self*, *i* = 0, *bbox* = None)

Returns a shape object for a shape in the geometry record file.  
If the 'bbox' arg is given (list or tuple of xmin,ymin,xmax,ymax), returns None if the shape is not within that region.

#### 15.15.8.29 shapefile.Reader.shapeRecord ( *self*, *i* = 0, *fields* = None, *bbox* = None)

Returns a combination geometry and attribute record for the supplied record index.  
To only read some of the fields, specify the 'fields' arg as a list of one or more fieldnames.  
If the 'bbox' arg is given (list or tuple of xmin,ymin,xmax,ymax), returns None if the shape is not within that region.

#### 15.15.8.30 shapefile.Reader.shapeRecords ( *self*, *fields* = None, *bbox* = None)

Returns a list of combination geometry/attribute records for all records in a shapefile.  
To only read some of the fields, specify the 'fields' arg as a list of one or more fieldnames.  
To only read entries within a given spatial region, specify the 'bbox' arg as a list or tuple of xmin,ymin,xmax,ymax.

#### 15.15.8.31 shapefile.Reader.shapes ( *self*, *bbox* = None)

Returns all shapes in a shapefile.  
To only read shapes within a given spatial region, specify the 'bbox' arg as a list or tuple of xmin,ymin,xmax,ymax.

15.15.8.32 shapefile.Reader.shapeTypeName ( *self*)

## 15.15.9 Member Data Documentation

15.15.9.1 shapefile.Reader.\_\_dbfHdrLength[private]

15.15.9.2 shapefile.Reader.\_\_fieldLookup[private]

15.15.9.3 shapefile.Reader.\_\_fullRecLookup[private]

15.15.9.4 shapefile.Reader.\_\_fullRecStruct[private]

15.15.9.5 shapefile.Reader.\_\_recordLength[private]

15.15.9.6 shapefile.Reader.\_files\_to\_close[protected]

15.15.9.7 shapefile.Reader.\_offsets[protected]

15.15.9.8 shapefile.Reader.bbox

15.15.9.9 shapefile.Reader.dbf

15.15.9.10 shapefile.Reader.encoding

15.15.9.11 shapefile.Reader.encodingErrors

15.15.9.12 shapefile.Reader.fields

15.15.9.13 shapefile.Reader.mbox

15.15.9.14 shapefile.Reader.numRecords

15.15.9.15 shapefile.Reader.numShapes

15.15.9.16 shapefile.Reader.shapeName

15.15.9.17 shapefile.Reader.shapeType

15.15.9.18 shapefile.Reader.shp

15.15.9.19 shapefile.Reader.shpLength

15.15.9.20 shapefile.Reader.shx

15.15.9.21 shapefile.Reader.zbox

15.15.9.22 The documentation for this class was generated from the following file:

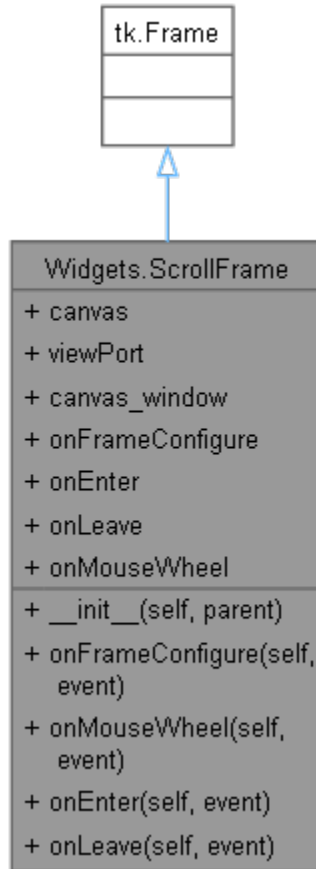
- PyshpMaster/**shapefile.py**

## 15.16 Widgets.ScrollFrame Class Reference

Scrollable Frame Class from

<https://gist.github.com/mp035/9f2027c3ef9172264532fcd6262f3b01>.

Inheritance diagram for Widgets.ScrollFrame:



### 15.16.1 Public Member Functions

- **`__init__`** (self, parent)
- **`onFrameConfigure`** (self, event)  
*whenever the size of the frame changes, alter the scroll region respectively.*
- **`onMouseWheel`** (self, event)  
*cross platform scroll wheel event*
- **`onEnter`** (self, event)  
*bind wheel events when the cursor enters the control*
- **`onLeave`** (self, event)  
*unbind wheel events when the cursor leaves the control*

## 15.16.2 Public Attributes

- `canvasviewPort`
- `canvas_window`
- `onFrameConfigure`
- `onEnter`
- `onLeave`
- `onMouseWheel`

## 15.16.3 Detailed Description

Scrollable                                  Frame                                  Class                                  from  
<https://gist.github.com/mp035/9f2027c3ef9172264532fcd6262f3b01>.

## 15.16.4 Constructor & Destructor Documentation

15.16.4.1 `Widgets.ScrollFrame.__init__ ( self, parent)`

## 15.16.5 Member Function Documentation

15.16.5.1 `Widgets.ScrollFrame.onEnter ( self, event)`

bind wheel events when the cursor enters the control

15.16.5.2 `Widgets.ScrollFrame.onFrameConfigure ( self, event)`

whenever the size of the frame changes, alter the scroll region respectively.

Reset the scroll region to encompass the inner frame

15.16.5.3 `Widgets.ScrollFrame.onLeave ( self, event)`

unbind wheel events when the cursor leaves the control

15.16.5.4 `Widgets.ScrollFrame.onMouseWheel ( self, event)`

cross platform scroll wheel event

## **15.16.6 Member Data Documentation**

15.16.6.1 Widgets.ScrollFrame.canvas

15.16.6.2 Widgets.ScrollFrame.canvas\_window

15.16.6.3 Widgets.ScrollFrame.onEnter

15.16.6.4 Widgets.ScrollFrame.onFrameConfigure

15.16.6.5 Widgets.ScrollFrame.onLeave

15.16.6.6 Widgets.ScrollFrame.onMouseWheel

15.16.6.7 Widgets.ScrollFrame.viewPort

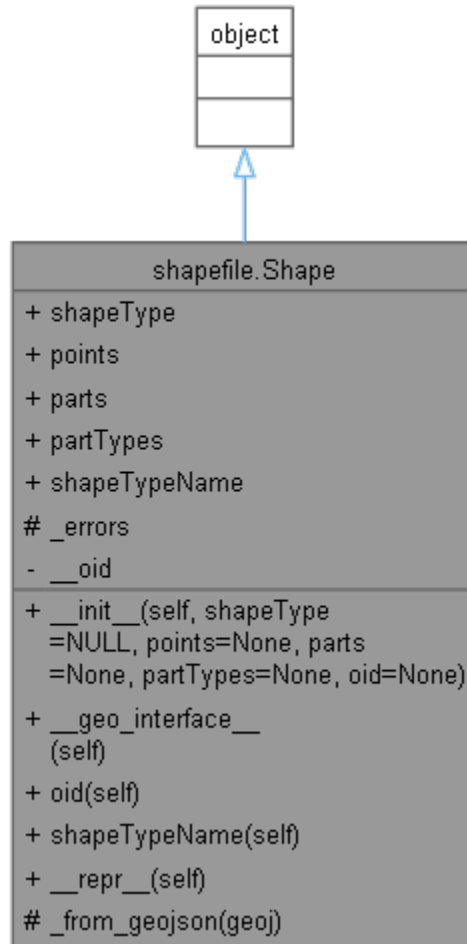
15.16.6.8 The documentation for this class was generated from the following file:

15.16.6.9 Widgets.py

## **15.17 shapefile.Shape Class Reference**

Inheritance diagram for shapefile.Shape:





### 15.17.1 Public Member Functions

- `__init__` (self, shapeType=NULL, points=None, parts=None, partTypes=None, oid=None)
- `__geo_interface__` (self)
- `oid` (self)
- `shapeTypeName` (self)
- `__repr__` (self)

### 15.17.2 Public Attributes

- `shapeType`
- `points`
- `parts`
- `partTypes`
- `shapeTypeName`

### 15.17.3 Static Protected Member Functions

- `_from_geojson` (geoj)

## 15.17.4 Protected Attributes

## 15.17.5 `_errorsPrivate` Attributes

`__oid`

## 15.17.6 Constructor & Destructor Documentation

15.17.6.1 `shapefile.Shape.__init__( self, shapeType = NULL, points = None, parts = None, partTypes = None, oid = None)`

Stores the geometry of the different shape types specified in the Shapefile spec. Shape types are usually point, polyline, or polygons. Every shape type except the "Null" type contains points at some level for example vertices in a polygon. If a shape type has multiple shapes containing points within a single geometry record then those shapes are called parts. Parts are designated by their starting index in geometry record's list of shapes. For MultiPatch geometry, partTypes designates the patch type of each of the parts.

## 15.17.7 Member Function Documentation

15.17.7.1 `shapefile.Shape.__geo_interface__( self)`

15.17.7.2 `shapefile.Shape.__repr__( self)`

15.17.7.3 `shapefile.Shape._from_geojson( geoj)[static], [protected]`

15.17.7.4 `shapefile.Shape.oid( self)`

The index position of the shape in the original shapefile

15.17.7.5 `shapefile.Shape.shapeTypeName( self)`

## 15.17.8 Member Data Documentation

15.17.8.1 `shapefile.Shape.__oid`[private]

15.17.8.2 `shapefile.Shape._errors`[protected]

15.17.8.3 `shapefile.Shape.parts`

15.17.8.4 `shapefile.Shape.partTypes`

15.17.8.5 `shapefile.Shape.points`

15.17.8.6 `shapefile.Shape.shapeType`

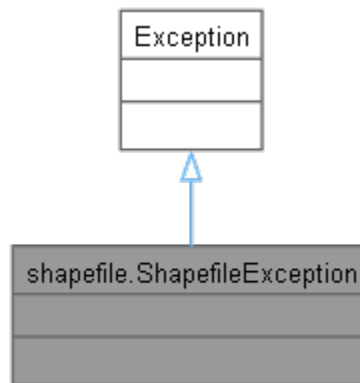
15.17.8.7 `shapefile.Shape.shapeTypeName`

15.17.8.8 The documentation for this class was generated from the following file:

- PyshpMaster/**shapefile.py**

## 15.18 shapefile.ShapefileException Class Reference

Inheritance diagram for `shapefile.ShapefileException`:



### 15.18.1 Detailed Description

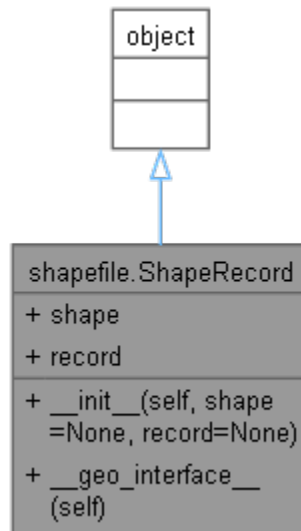
An exception to handle shapefile specific problems.

The documentation for this class was generated from the following file:

- PyshpMaster/**shapefile.py**

## 15.19 shapefile.ShapeRecord Class Reference

Inheritance diagram for shapefile.ShapeRecord:



### 15.19.1 Public Member Functions

- `__init__(self, shape=None, record=None)`
- `__geo_interface__(self)`

### 15.19.2 Public Attributes

- `shaperecord`

### 15.19.3 Detailed Description

A ShapeRecord object containing a shape along with its attributes.

Provides the GeoJSON `__geo_interface__` to return a Feature dictionary.

### 15.19.4 Constructor & Destructor Documentation

15.19.4.1 `shapefile.ShapeRecord.__init__( self, shape = None, record = None)`

### 15.19.5 Member Function Documentation

15.19.5.1 `shapefile.ShapeRecord.__geo_interface__( self)`

## 15.19.6 Member Data Documentation

15.19.6.1 `shapefile.ShapeRecord.record`

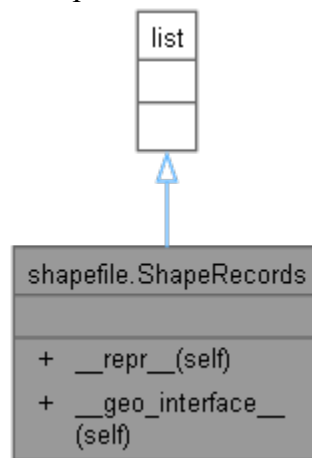
15.19.6.2 `shapefile.ShapeRecord.shape`

15.19.6.3 The documentation for this class was generated from the following file:

- `PyshpMaster/shapefile.py`

## 15.20 `shapefile.ShapeRecords` Class Reference

Inheritance diagram for `shapefile.ShapeRecords`:



### 15.20.1 Public Member Functions

- `__repr__(self)`
- `__geo_interface__(self)`

### 15.20.2 Detailed Description

A class to hold a list of `ShapeRecord` objects. Subclasses `list` to ensure compatibility with former work and to reuse all the optimizations of the builtin `list`. In addition to the `list` interface, this also provides the GeoJSON `__geo_interface__` to return a `FeatureCollection` dictionary.

### 15.20.3 Member Function Documentation

15.20.3.1 `shapefile.ShapeRecords.__geo_interface__( self)`

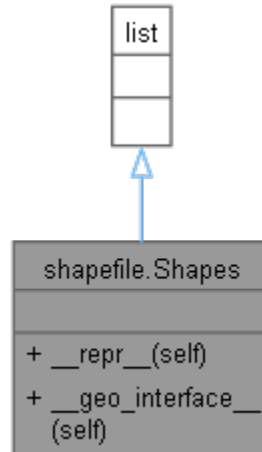
15.20.3.2 `shapefile.ShapeRecords.__repr__( self)`

15.20.3.3 The documentation for this class was generated from the following file:

- PyshpMaster/**shapefile.py**

## 15.21 shapefile.Shapes Class Reference

Inheritance diagram for shapefile.Shapes:



### 15.21.1 Public Member Functions

- `__repr__(self)`
- `__geo_interface__(self)`

### 15.21.2 Detailed Description

A class to hold a list of Shape objects. Subclasses list to ensure compatibility with former work and to reuse all the optimizations of the builtin list.

In addition to the list interface, this also provides the GeoJSON `__geo_interface__` to return a GeometryCollection dictionary.

### 15.21.3 Member Function Documentation

15.21.3.1 `shapefile.Shapes.__geo_interface__( self)`

15.21.3.2 `shapefile.Shapes.__repr__( self)`

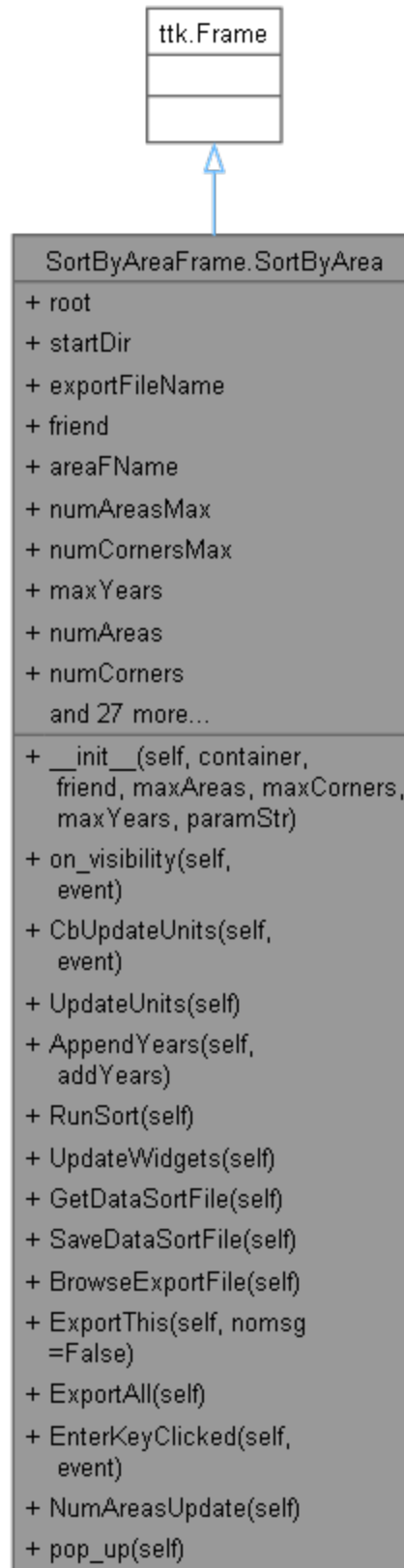
15.21.3.3 The documentation for this class was generated from the following file:

- PyshpMaster/**shapefile.py**

## 15.22 SortByAreaFrame.SortByArea Class Reference

This class is used to assist the user in defining areas of interest to assess accumulated parameters located in these areas of interest.

Inheritance diagram for SortByAreaFrame.SortByArea:



### 15.22.1 Public Member Functions

- **\_\_init\_\_** (self, container, **friend**, maxAreas, maxCorners, **maxYears**, paramStr)
- **on\_visibility** (self, event)
- **CbUpdateUnits** (self, event)
- **UpdateUnits** (self)
- **AppendYears** (self, addYears)
- **RunSort** (self)
- **UpdateWidgets** (self)
- **GetDataSortFile** (self)
- **SaveDataSortFile** (self)
- **BrowseExportFile** (self)
- **ExportThis** (self, nomsg=False)

*This method exports the current page of data, just a single output parameter.*

- **ExportAll** (self)  
*Export all select parameters.*
- **EnterKeyClicked** (self, event)
- **NumAreasUpdate** (self)
- **pop\_up** (self)  
*Help Window for Sort By Area.*

### 15.22.2 Public Attributes

- **rootstartDir**
- **exportFileName**
- **friend**
- **areaFName**
- **numAreasMax**
- **numCornersMax**
- **maxYears**
- **numAreas**  
*f.write('AREA,YEAR,' + outStr + ' ('+ units + '')*  
*) Write Header*
- **numCornersparamStr**
- **yearStart**  
*f.write('AREA,YEAR,' + outStr + ' ('+ units + '')*  
*) Write Header*
- **yearStopnumYears**  
*f.write('AREA,YEAR,' + outStr + ' ('+ units + '')*  
*) Write Header*
- **areaDatascrollFrame**
- **numAreasLabel**
- **numAreasEntry**



- EnterKeyClicked
- outputParmLabel
- comboParameter
- CbUpdateUnits
- dataSortFileLabel
- dataSortFileEntry
- dataSortUnitsLabel
- dataSortUnitsEntry
- openDataSortButton
- saveDataSortButton
- runSortButton
- exportThisSortButton
- exportAllSortButton
- exportFileLabel
- exportFileEntry
- browseExportButton
- areas
- on\_visibility
- domainName

### 15.22.3 Detailed Description

This class is used to assist the user in defining areas of interest to assess accumulated parameters located in these areas of interest.

#### 15.22.3.1.1 Parameters

<i>friend</i>	is used to access Start and Stop year from the Main Frame
<i>maxAreas</i>	defined at start up for the maximum allowed areas
<i>maxCorners</i>	defined at start up for the maximum allowed corners or nodes
<i>maxYears</i>	defined at start up for the maximum allowed year range
<i>paramStr</i>	defined at start up for the desired outputs

### 15.22.4 Constructor & Destructor Documentation

15.22.4.1 SortByAreaFrame.SortByArea.\_\_init\_\_( *self*, *container*, *friend*, *maxAreas*, *maxCorners*, *maxYears*, *paramStr*)

## 15.22.5 Member Function Documentation

15.22.5.1 `SortByAreaFrame.SortByArea.AppendYears ( self, addYears)`

15.22.5.2 `SortByAreaFrame.SortByArea.BrowseExportFile ( self)`

15.22.5.3 `SortByAreaFrame.SortByArea.CbUpdateUnits ( self, event)`

15.22.5.4 `SortByAreaFrame.SortByArea.EnterKeyClicked ( self, event)`

15.22.5.5 `SortByAreaFrame.SortByArea.ExportAll ( self)`

Export all select parameters.

For each parameter

- Verify data file exists, Lat\_Lon\_Grid\_ + ABUN\_ + AL + \_ 2015\_2017

15.22.5.6 `SortByAreaFrame.SortByArea.ExportThis ( self, nomsg = False)`

This method exports the current page of data, just a single output parameter.

First row : AREA YEAR PARAMETER (UNITS) 1 StartYear

1 ... 1 StopYear ... ... N StartYear

N ... N StopYear

15.22.5.7 `SortByAreaFrame.SortByArea.GetDataSortFile ( self)`

15.22.5.8 `SortByAreaFrame.SortByArea.NumAreasUpdate ( self)`

Updates the number of areas functions.

15.22.5.9 `SortByAreaFrame.SortByArea.on_visibility ( self, event)`

15.22.5.10 `SortByAreaFrame.SortByArea.pop_up ( self)`

Help Window for Sort By Area.

15.22.5.11 `SortByAreaFrame.SortByArea.RunSort ( self)`

15.22.5.12 `SortByAreaFrame.SortByArea.SaveDataSortFile ( self)`

15.22.5.13 `SortByAreaFrame.SortByArea.UpdateUnits ( self)`

15.22.5.14 `SortByAreaFrame.SortByArea.UpdateWidgets ( self)`

## 15.22.6 Member Data Documentation

- 15.22.6.1 SortByAreaFrame.SortByArea.areaData
- 15.22.6.2 SortByAreaFrame.SortByArea.areaFName
- 15.22.6.3 SortByAreaFrame.SortByArea.areas
- 15.22.6.4 SortByAreaFrame.SortByArea.browseExportButton
- 15.22.6.5 SortByAreaFrame.SortByArea.CbUpdateUnits
- 15.22.6.6 SortByAreaFrame.SortByArea.comboParameter
- 15.22.6.7 SortByAreaFrame.SortByArea.dataSortFileEntry
- 15.22.6.8 SortByAreaFrame.SortByArea.dataSortFileLabel
- 15.22.6.9 SortByAreaFrame.SortByArea.dataSortUnitsEntry
- 15.22.6.10 SortByAreaFrame.SortByArea.dataSortUnitsLabel
- 15.22.6.11 SortByAreaFrame.SortByArea.domainName
- 15.22.6.12 SortByAreaFrame.SortByArea.EnterKeyClicked
- 15.22.6.13 SortByAreaFrame.SortByArea.exportAllSortButton
- 15.22.6.14 SortByAreaFrame.SortByArea.exportFileEntry
- 15.22.6.15 SortByAreaFrame.SortByArea.exportFileLabel
- 15.22.6.16 SortByAreaFrame.SortByArea.exportFileName
- 15.22.6.17 SortByAreaFrame.SortByArea.exportThisSortButton
- 15.22.6.18 SortByAreaFrame.SortByArea.friend
- 15.22.6.19 SortByAreaFrame.SortByArea.maxYears
- 15.22.6.20 SortByAreaFrame.SortByArea.numAreas

```
f.write('AREA,YEAR,' + outStr + ' ('+ units + ')\n') Write Header
```

15.22.6.21 SortByAreaFrame.SortByArea.numAreasEntry

15.22.6.22 SortByAreaFrame.SortByArea.numAreasLabel

15.22.6.23 SortByAreaFrame.SortByArea.numAreasMax

15.22.6.24 SortByAreaFrame.SortByArea.numCorners

15.22.6.25 SortByAreaFrame.SortByArea.numCornersMax

15.22.6.26 SortByAreaFrame.SortByArea.numYears

```
f.write('AREA,YEAR,' + outStr + ' ('+ units + ')\n') Write Header
```

15.22.6.27 SortByAreaFrame.SortByArea.on\_visibility

15.22.6.28 SortByAreaFrame.SortByArea.openDataSortButton

15.22.6.29 SortByAreaFrame.SortByArea.outputParmLabel

15.22.6.30 SortByAreaFrame.SortByArea.paramStr

15.22.6.31 SortByAreaFrame.SortByArea.root

15.22.6.32 SortByAreaFrame.SortByArea.runSortButton

15.22.6.33 SortByAreaFrame.SortByArea.saveDataSortButton

15.22.6.34 SortByAreaFrame.SortByArea.scrollFrame

15.22.6.35 SortByAreaFrame.SortByArea.startDir

15.22.6.36 SortByAreaFrame.SortByArea.yearStart

```
f.write('AREA,YEAR,' + outStr + ' ('+ units + ')\n') Write Header
```

15.22.6.37 SortByAreaFrame.SortByArea.yearStop

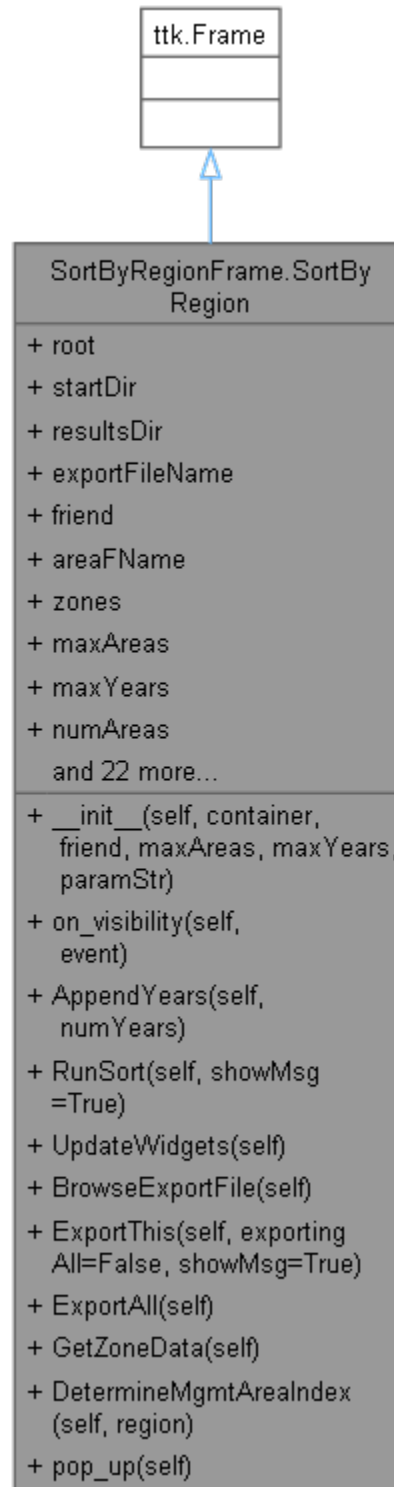
15.22.6.38 The documentation for this class was generated from the following file:

15.22.6.39 SortByAreaFrame.py

## 15.23 SortByRegionFrame.SortByRegion Class Reference

This class is used to assist the user in defining areas of interest to assess accumulated parameters located in these areas of interest.

Inheritance diagram for SortByRegionFrame.SortByRegion:



### 15.23.1 Public Member Functions

- **\_\_init\_\_** (self, container, **friend**, **maxAreas**, **maxYears**, **paramStr**)
- **on\_visibility** (self, event)
- **AppendYears** (self, **numYears**)  
*Max Number of years has increased, need to add additional columns.*
- **RunSort** (self, showMsg=True)
- **UpdateWidgets** (self)
- **BrowseExportFile** (self)
- **ExportThis** (self, exportingAll=False, showMsg=True)  
*This method exports output parameter table to its own file name.*
- **ExportAll** (self)  
*Export all select parameters.*
- **GetZoneData** (self)  
*Gets shape data and places it into a array of GeoShape.*
- **DetermineMgmtAreaIndex** (self, region)  
*determine Management Area Index*
- **pop\_up** (self)  
*Help Window for Sort By Area.*

### 15.23.2 Public Attributes

- **rootstartDir**
- **resultsDir**
- **exportFileName**
- **friend**
- **areaFName**
- **zones**
- **maxAreas**
- **maxYears**
- **numAreas**
- **numCorners**
- **paramStr**
- **areaKm2**
- **yearStart**
- **yearStop**
- **numYears**
- **scrollFrame**
- **sortAreaFrame**
- **outputParmLabel**
- **comboParameter**
- **runSortButton**
- **exportThisSortButton**
- **exportAllSortButton**

- **exportFileLabel**
- **exportFileEntry**
- **browseExportButton**
- **tableRows**
- **tableCols**
- **firstYrCol**
- **table**
- **on\_visibility**
- **domainName**

### 15.23.3 Detailed Description

This class is used to assist the user in defining areas of interest to assess accumulated parameters located in these areas of interest.

#### 15.23.3.1 Parameters

<i>friend</i>	is used to access Start and Stop year from the Main Frame
<i>maxAreas</i>	defined at start up for the maximum allowed areas
<i>maxCorners</i>	defined at start up for the maximum allowed corners or nodes
<i>maxYears</i>	defined at start up for the maximum allowed year range
<i>paramStr</i>	defined at start up for the desired outputs

### 15.23.4 Constructor & Destructor Documentation

15.23.4.1 `SortByRegionFrame.SortByRegion.__init__( self, container, friend, maxAreas, maxYears, paramStr)`

### 15.23.5 Member Function Documentation

15.23.5.1 `SortByRegionFrame.SortByRegion.AppendYears ( self, numYears)`

Max Number of years has increased, need to add additional columns.

15.23.5.2 `SortByRegionFrame.SortByRegion.BrowseExportFile ( self)`

15.23.5.3 `SortByRegionFrame.SortByRegion.DetermineMgmtAreaIndex ( self, region)`

determine Management Area Index

15.23.5.4 `SortByRegionFrame.SortByRegion.ExportAll ( self)`

Export all select parameters.

For each parameter

- Verify data file exists, Lat\_Lon\_Grid\_ + ABUN\_ + AL + \_ 2015\_2017

15.23.5.5 `SortByRegionFrame.SortByRegion.ExportThis ( self, exportingAll = False, showMsg = True)`

This method exports output parameter table to its own file name.

#### 15.23.5.6 SortByRegionFrame.SortByRegion.GetZoneData ( *self*)

Gets shape data and places it into a array of GeoShape.

MA regions, if selected, are first placed into array followed by GB regions, selected. Logic will always have either MA, GB, or both

#### 15.23.5.7 SortByRegionFrame.SortByRegion.on\_visibility ( *self*, *event*)

#### 15.23.5.8 SortByRegionFrame.SortByRegion.pop\_up ( *self*)

Help Window for Sort By Area.



15.23.5.9 SortByRegionFrame.SortByRegion.RunSort ( *self*, *showMsg* = True)

15.23.5.10 SortByRegionFrame.SortByRegion.UpdateWidgets ( *self*)

## **15.23.6 Member Data Documentation**

15.23.6.1 SortByRegionFrame.SortByRegion.areaFName

15.23.6.2 SortByRegionFrame.SortByRegion.areaKm2

15.23.6.3 SortByRegionFrame.SortByRegion.browseExportButton

15.23.6.4 SortByRegionFrame.SortByRegion.comboParameter

15.23.6.5 SortByRegionFrame.SortByRegion.domainName

15.23.6.6 SortByRegionFrame.SortByRegion.exportAllSortButton

15.23.6.7 SortByRegionFrame.SortByRegion.exportFileEntry

15.23.6.8 SortByRegionFrame.SortByRegion.exportFileLabel

15.23.6.9 SortByRegionFrame.SortByRegion.exportFileName

15.23.6.10 SortByRegionFrame.SortByRegion.exportThisSortButton

15.23.6.11 SortByRegionFrame.SortByRegion.firstYrCol

15.23.6.12 SortByRegionFrame.SortByRegion.friend

15.23.6.13 SortByRegionFrame.SortByRegion.maxAreas

15.23.6.14 SortByRegionFrame.SortByRegion.maxYears

15.23.6.15 SortByRegionFrame.SortByRegion.numAreas

15.23.6.16 SortByRegionFrame.SortByRegion.numCorners

15.23.6.17 SortByRegionFrame.SortByRegion.numYears

15.23.6.18 SortByRegionFrame.SortByRegion.on\_visibility

15.23.6.19 SortByRegionFrame.SortByRegion.outputParmLabel

15.23.6.20 SortByRegionFrame.SortByRegion.paramStr

15.23.6.21 SortByRegionFrame.SortByRegion.resultsDir

15.23.6.22 SortByRegionFrame.SortByRegion.root

15.23.6.23 SortByRegionFrame.SortByRegion.runSortButton

15.23.6.24 SortByRegionFrame.SortByRegion.scrollFrame

15.23.6.25 SortByRegionFrame.SortByRegion.sortAreaFrame

15.23.6.26 SortByRegionFrame.SortByRegion.startDir

15.23.6.27 SortByRegionFrame.SortByRegion.table

15.23.6.28 SortByRegionFrame.SortByRegion.tableCols

15.23.6.29 SortByRegionFrame.SortByRegion.tableRows

15.23.6.30 SortByRegionFrame.SortByRegion.yearStart

15.23.6.31 SortByRegionFrame.SortByRegion.yearStop

15.23.6.32 SortByRegionFrame.SortByRegion.zones

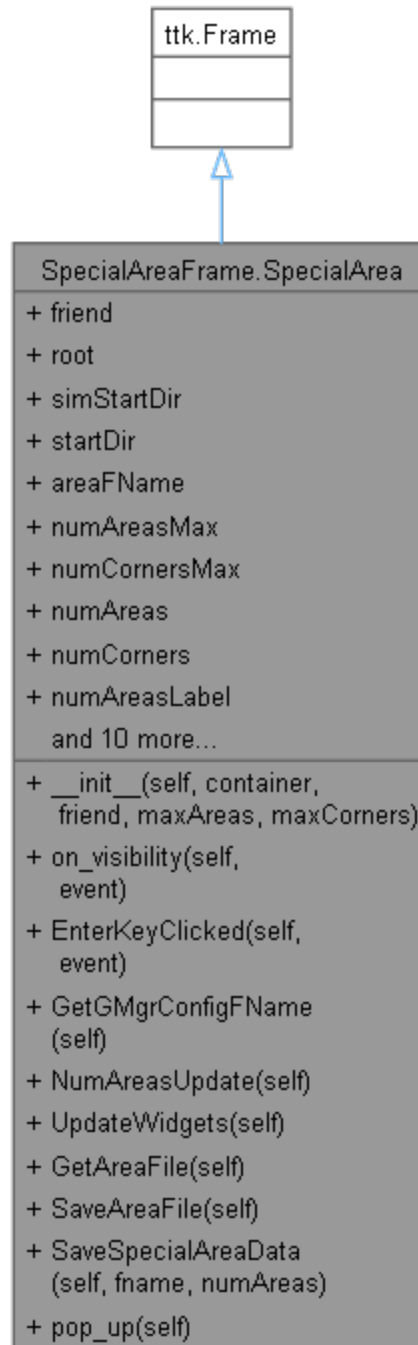
15.23.6.33 The documentation for this class was generated from the following file:

15.23.6.34 SortByRegionFrame.py

## **15.24 SpecialAreaFrame.SpecialArea Class Reference**

This class is used to assist the user in defining areas of interest to assess accumulated parameters located in these areas of interest.

Inheritance diagram for SpecialAreaFrame.SpecialArea:



### 15.24.1 Public Member Functions

- **`__init__`** (self, container, **friend**, maxAreas, maxCorners)
- **`on_visibility`** (self, event)
- **`EnterKeyClicked`** (self, event)
- **`GetGMgrConfigFName`** (self)

*Calls the `filedialog` method `asksaveasfilename` to name a file to be used for the Grid Manager Configuration file.*

- **NumAreasUpdate** (self)
- **UpdateWidgets** (self)
- **GetAreaFile** (self)
- **SaveAreaFile** (self)
- **SaveSpecialAreaData** (self, fname, numAreas)
- **pop\_up** (self)

*Help Window for Special Access Area.*

### 15.24.2 Public Attributes

- **friendroot**
- **simStartDir**
- **startDir**
- **areaFName**
- **numAreasMax**
- **numCornersMax**
- **numAreas**
- **numCorners**
- **numAreasLabel**
- **numAreasEntry**
- **EnterKeyClicked**
- **gmCfgFile**
- **openGmgrConfigButton**
- **openAreaFileButton**
- **specAccFile**
- **specAccFileLabel**
- **saveAreaFileButton**
- **areaMgr**
- **on\_visibility**

### 15.24.3 Detailed Description

This class is used to assist the user in defining areas of interest to assess accumulated parameters located in these areas of interest.

### 15.24.4 Constructor & Destructor Documentation

- 15.24.4.1 **SpecialAreaFrame.SpecialArea.\_\_init\_\_** ( self, container, friend, maxAreas, maxCorners)

## 15.24.5 Member Function Documentation

15.24.5.1 SpecialAreaFrame.SpecialArea.EnterKeyClicked ( *self*, *event*)

15.24.5.2 SpecialAreaFrame.SpecialArea.GetAreaFile ( *self*)

15.24.5.3 SpecialAreaFrame.SpecialArea.GetGMgrConfigFName ( *self*)

Calls the `filedialog` method `asksaveasfilename` to name a file to be used for the Grid Manager Configuration file.

It then writes out the defined parameters to this file using the 'tag = value' format.

15.24.5.4 SpecialAreaFrame.SpecialArea.NumAreasUpdate ( *self*)

15.24.5.5 SpecialAreaFrame.SpecialArea.on\_visibility ( *self*, *event*)

15.24.5.6 SpecialAreaFrame.SpecialArea.pop\_up ( *self*)

Help Window for Special Access Area.

15.24.5.7 SpecialAreaFrame.SpecialArea.SaveAreaFile ( *self*)

15.24.5.8 SpecialAreaFrame.SpecialArea.SaveSpecialAreaData ( *self*, *fname*, *numAreas*)

15.24.5.9 SpecialAreaFrame.SpecialArea.UpdateWidgets ( *self*)

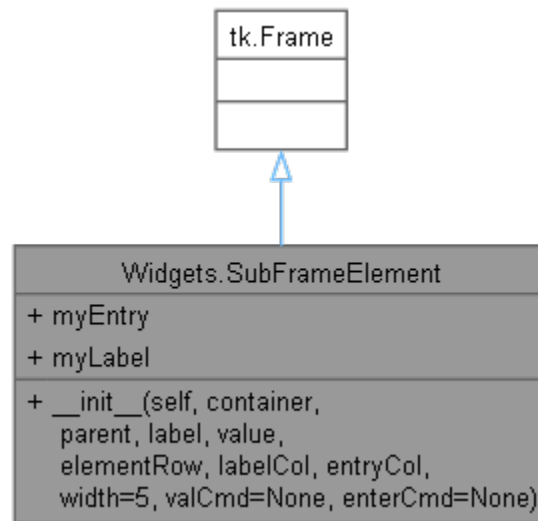
## **15.24.6 Member Data Documentation**

- 15.24.6.1 SpecialAreaFrame.SpecialArea.areaFName
- 15.24.6.2 SpecialAreaFrame.SpecialArea.areaMgr
- 15.24.6.3 SpecialAreaFrame.SpecialArea.EnterKeyClicked
- 15.24.6.4 SpecialAreaFrame.SpecialArea.friend
- 15.24.6.5 SpecialAreaFrame.SpecialArea.gmCfgFile
- 15.24.6.6 SpecialAreaFrame.SpecialArea.numAreas
- 15.24.6.7 SpecialAreaFrame.SpecialArea.numAreasEntry
- 15.24.6.8 SpecialAreaFrame.SpecialArea.numAreasLabel
- 15.24.6.9 SpecialAreaFrame.SpecialArea.numAreasMax
- 15.24.6.10 SpecialAreaFrame.SpecialArea.numCorners
- 15.24.6.11 SpecialAreaFrame.SpecialArea.numCornersMax
- 15.24.6.12 SpecialAreaFrame.SpecialArea.on\_visibility
- 15.24.6.13 SpecialAreaFrame.SpecialArea.openAreaFileButton
- 15.24.6.14 SpecialAreaFrame.SpecialArea.openGmgrConfigButton
- 15.24.6.15 SpecialAreaFrame.SpecialArea.root
- 15.24.6.16 SpecialAreaFrame.SpecialArea.saveAreaFileButton
- 15.24.6.17 SpecialAreaFrame.SpecialArea.simStartDir
- 15.24.6.18 SpecialAreaFrame.SpecialArea.specAccFile
- 15.24.6.19 SpecialAreaFrame.SpecialArea.specAccFileLabel
- 15.24.6.20 SpecialAreaFrame.SpecialArea.startDir
- 15.24.6.21 The documentation for this class was generated from the following file:
- 15.24.6.22 SpecialAreaFrame.py

## 15.25 Widgets.SubFrameElement Class Reference

Generic Element.

Inheritance diagram for Widgets.SubFrameElement:



### 15.25.1 Public Member Functions

- `__init__`(self, container, parent, label, value, elementRow, labelCol, entryCol, width=5, valCmd=None, enterCmd=None)

### 15.25.2 Public Attributes

- `myEntry``myLabel`

### 15.25.3 Detailed Description

Generic Element.

Provides a label and an entry field. Optionally allows programmer to specify a method to validate entry and another method to respond to Enter Key.

### 15.25.4 Constructor & Destructor Documentation

15.25.4.1 `Widgets.SubFrameElement.__init__( self, container, parent, label, value, elementRow, labelCol, entryCol, width = 5, valCmd = None, enterCmd = None)`

## 15.25.5 Member Data Documentation

15.25.5.1 Widgets.SubFrameElement.myEntry

15.25.5.2 Widgets.SubFrameElement.myLabel

15.25.5.3 The documentation for this class was generated from the following file:

15.25.5.4 Widgets.py

## 15.26 Widgets.SubFrameInterpFunction Class Reference

Inheritance diagram for Widgets.SubFrameInterpFunction:



### 15.26.1 Public Member Functions

- `__init__(self, container, parent, funcNum, dim, shape, preconNum, elementRow, elementCol)`

### 15.26.2 Public Attributes

- `funcFramedimVal`
- `myDimRBx`



- **myDimRBy**
- **myDimRBz**
- **shapeVal**
- **myShapeG**
- **myShapeL**
- **myShapeS**
- **myShapeC**
- **preconLabel**
- **preconEntry**

### **15.26.3 Constructor & Destructor Documentation**

15.26.3.1 Widgets.SubFrameInterpFunction.\_\_init\_\_( *self*, *container*, *parent*, *funcNum*, *dim*, *shape*, *preconNum*, *elementRow*, *elementCol*)

### **15.26.4 Member Data Documentation**

15.26.4.1 Widgets.SubFrameInterpFunction.dimVal

15.26.4.2 Widgets.SubFrameInterpFunction.funcFrame

15.26.4.3 Widgets.SubFrameInterpFunction.myDimRBx

15.26.4.4 Widgets.SubFrameInterpFunction.myDimRBy

15.26.4.5 Widgets.SubFrameInterpFunction.myDimRBz

15.26.4.6 Widgets.SubFrameInterpFunction.myShapeC

15.26.4.7 Widgets.SubFrameInterpFunction.myShapeG

15.26.4.8 Widgets.SubFrameInterpFunction.myShapeL

15.26.4.9 Widgets.SubFrameInterpFunction.myShapeS

15.26.4.10 Widgets.SubFrameInterpFunction.preconEntry

15.26.4.11 Widgets.SubFrameInterpFunction.preconLabel

15.26.4.12 Widgets.SubFrameInterpFunction.shapeVal

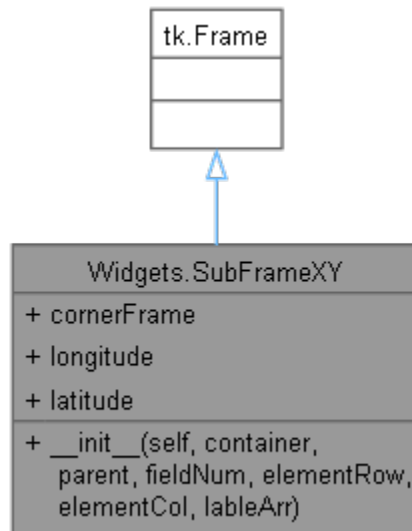
15.26.4.13 The documentation for this class was generated from the following file:

15.26.4.14 Widgets.py

## 15.27 Widgets.SubFrameXY Class Reference

Widget for XY label and entry.

Inheritance diagram for Widgets.SubFrameXY:



### 15.27.1 Public Member Functions

- `__init__`(self, container, parent, fieldNum, elementRow, elementCol, lableArr)

### 15.27.2 Public Attributes

- `cornerFramelongitude`
- `latitude`

### 15.27.3 Detailed Description

Widget for XY label and entry.

Longitude, Latitude have become interchangeable with X, Y

### 15.27.4 Constructor & Destructor Documentation

15.27.4.1 `Widgets.SubFrameXY.__init__( self, container, parent, fieldNum, elementRow, elementCol, lableArr)`

## **15.27.5 Member Data Documentation**

15.27.5.1 `Widgets.SubFrameXY.cornerFrame`

15.27.5.2 `Widgets.SubFrameXY.latitude`

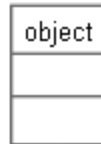
15.27.5.3 `Widgets.SubFrameXY.longitude`

15.27.5.4 The documentation for this class was generated from the following file:

15.27.5.5 `Widgets.py`

## **15.28 shapefile.Writer Class Reference**

Inheritance diagram for `shapefile.Writer`:



shapefile.Writer
+ target + autoBalance + fields + shapeType + shp + shx + dbf + recNum + shpNum + deletionFlag + encoding + encodingErrors # _files_to_close # _bbox # _zbox # _mbox
+ __init__(self, target=None, shapeType=None, autoBalance=False, **kwargs) + __len__(self) + __enter__(self) + __exit__(self, exc_type, exc_val, exc_tb) + __del__(self) + close(self) + shapeTypeName(self) + bbox(self) + zbox(self) + mbox(self) and 18 more... # _shapeparts(self, parts, shapeType) - __getFileObj(self, f) - __shpFileLength(self) - __bbox(self, s) - __zbox(self, s) - __mbox(self, s) - __shapefileHeader(self, fileObj, headerType='shp')

### 15.28.1 Public Member Functions

- **`__init__`** (self, target=None, shapeType=None, autoBalance=False, \*\*kwargs)
- **`__len__`** (self)
- **`__enter__`** (self)
- **`__exit__`** (self, exc\_type, exc\_val, exc\_tb)
- **`__del__`** (self)
- **`close`** (self)
- **`shapeTypeName`** (self)
- **`bbox`** (self)
- **`zbox`** (self)
- **`mbox`** (self)
- **`shape`** (self, s)
- **`record`** (self, \*recordList, \*\*recordDict)
- **`balance`** (self)
- **`null`** (self)
- **`point`** (self, x, y)
- **`pointm`** (self, x, y, m=None)
- **`pointz`** (self, x, y, z=0, m=None)
- **`multipoint`** (self, points)
- **`multipointm`** (self, points)
- **`multipointz`** (self, points)
- **`line`** (self, lines)
- **`linem`** (self, lines)
- **`linez`** (self, lines)
- **`poly`** (self, polys)
- **`polym`** (self, polys)
- **`polyz`** (self, polys)
- **`multipatch`** (self, parts, partTypes)
- **`field`** (self, name, fieldType="C", size="50", decimal=0)

### 15.28.2 Public Attributes

- **`targetautoBalance`**
- **`fields`**
- **`shapeType`**
- **`shp`**
- **`shx`**
- **`dbf`**
- **`recNum`**
- **`shpNum`**
- **`deletionFlag`**
- **`encoding`**
- **`encodingErrors`**

### 15.28.3 Protected Member Functions

- **`_shapeparts`** (self, parts, shapeType)

### 15.28.4 Protected Attributes

- **`_files_to_close_bbox`**
- **`_zbox`**

- `__mbox`

## 15.28.5 Private Member Functions

- `__getFileObj` (self, f)
- `__shpFileLength` (self)
- `__bbox` (self, s)
- `__zbox` (self, s)
- `__mbox` (self, s)
- `__shapefileHeader` (self, fileObj, headerType='shp')
- `__dbfHeader` (self)
- `__shpRecord` (self, s)
- `__shxRecord` (self, offset, length)
- `__dbfRecord` (self, record)

## 15.28.6 Detailed Description

Provides write support for ESRI Shapefiles.

## 15.28.7 Constructor & Destructor Documentation

15.28.7.1 `shapefile.Writer.__init__ ( self, target = None, shapeType = None, autoBalance = False, ** kwargs)`

15.28.7.2 `shapefile.Writer.__del__ ( self)`

## 15.28.8 Member Function Documentation

15.28.8.1 `shapefile.Writer.__bbox ( self, s)[private]`

15.28.8.2 `shapefile.Writer.__dbfHeader ( self)[private]`

Writes the dbf header and field descriptors.

15.28.8.3 `shapefile.Writer.__dbfRecord ( self, record)[private]`

Writes the dbf records.

15.28.8.4 `shapefile.Writer.__enter__ ( self)`

Enter phase of context manager.

15.28.8.5 `shapefile.Writer.__exit__ ( self, exc_type, exc_val, exc_tb)`

Exit phase of context manager, finish writing and close the files.

15.28.8.6 `shapefile.Writer.__getFileObj ( self, f)[private]`

Safety handler to verify file-like objects

15.28.8.7 `shapefile.Writer.__len__ ( self)`

Returns the current number of features written to the shapefile.  
If shapes and records are unbalanced, the length is considered the highest of the two.

15.28.8.8 `shapefile.Writer.__mbox ( self, s)[private]`

15.28.8.9 `shapefile.Writer.__shapefileHeader ( self, fileObj, headerType = 'shp')[private]`

Writes the specified header type to the specified file-like object.  
Several of the shapefile formats are so similar that a single generic method to read or write them is warranted.

15.28.8.10 `shapefile.Writer.__shpFileLength ( self)[private]`

Calculates the file length of the shp file.

15.28.8.11 `shapefile.Writer.__shpRecord ( self, s)[private]`

15.28.8.12 `shapefile.Writer.__shxRecord ( self, offset, length)[private]`

Writes the shx records.

15.28.8.13 `shapefile.Writer.__zbox ( self, s)[private]`

15.28.8.14 `shapefile.Writer._shapeparts ( self, parts, shapeType)[protected]`

Internal method for adding a shape that has multiple collections of points (parts): lines, polygons, and multipoint shapes.

15.28.8.15 `shapefile.Writer.balance ( self)`

Adds corresponding empty attributes or null geometry records depending on which type of record was created to make sure all three files are in synch.

#### 15.28.8.16 shapefile.Writer.bbox ( *self*)

Returns the current bounding box for the shapefile which is the lower-left and upper-right corners. It does not contain the elevation or measure extremes.

#### 15.28.8.17 shapefile.Writer.close ( *self*)

Write final shp, shx, and dbf headers, close opened files.

#### 15.28.8.18 shapefile.Writer.field ( *self*, *name*, *fieldType* = "C", *size* = "50", *decimal* = 0)

Adds a dbf field descriptor to the shapefile.

#### 15.28.8.19 shapefile.Writer.line ( *self*, *lines*)

Creates a POLYLINE shape.

Lines is a collection of lines, each made up of a list of xy values.

#### 15.28.8.20 shapefile.Writer.linem ( *self*, *lines*)

Creates a POLYLINEM shape.

Lines is a collection of lines, each made up of a list of xym values.

If the m (measure) value is not included, it defaults to None (NoData).

#### 15.28.8.21 shapefile.Writer.linez ( *self*, *lines*)

Creates a POLYLINEZ shape.

Lines is a collection of lines, each made up of a list of xyzm values.

If the z (elevation) value is not included, it defaults to 0.

If the m (measure) value is not included, it defaults to None (NoData).

#### 15.28.8.22 shapefile.Writer.mbox ( *self*)

Returns the current m extremes for the shapefile.

#### 15.28.8.23 shapefile.Writer.multipatch ( *self*, *parts*, *partTypes*)

Creates a MULTIPATCH shape.

Parts is a collection of 3D surface patches, each made up of a list of xyzm values.

PartTypes is a list of types that define each of the surface patches.

The types can be any of the following module constants: TRIANGLE\_STRIP, TRIANGLE\_FAN, OUTER\_RING, INNER\_RING, FIRST\_RING, or RING.

If the z (elevation) value is not included, it defaults to 0.

If the m (measure) value is not included, it defaults to None (NoData).



#### 15.28.8.24 shapefile.Writer.multipoint ( *self*, *points*)

Creates a MULTIPOINT shape.

Points is a list of xy values.

#### 15.28.8.25 shapefile.Writer.multipointm ( *self*, *points*)

Creates a MULTIPOINTM shape.

Points is a list of xym values.

If the m (measure) value is not included, it defaults to None (NoData).

#### 15.28.8.26 shapefile.Writer.multipointz ( *self*, *points*)

Creates a MULTIPOINTZ shape.

Points is a list of xyzm values.

If the z (elevation) value is not included, it defaults to 0.

If the m (measure) value is not included, it defaults to None (NoData).

#### 15.28.8.27 shapefile.Writer.null ( *self*)

Creates a null shape.

#### 15.28.8.28 shapefile.Writer.point ( *self*, *x*, *y*)

Creates a POINT shape.

#### 15.28.8.29 shapefile.Writer.pointm ( *self*, *x*, *y*, *m* = None)

Creates a POINTM shape.

If the m (measure) value is not set, it defaults to NoData.

#### 15.28.8.30 shapefile.Writer.pointz ( *self*, *x*, *y*, *z* = 0, *m* = None)

Creates a POINTZ shape.

If the z (elevation) value is not set, it defaults to 0.

If the m (measure) value is not set, it defaults to NoData.

#### 15.28.8.31 shapefile.Writer.poly ( *self*, *polys*)

Creates a POLYGON shape.

Polys is a collection of polygons, each made up of a list of xy values.

Note that for ordinary polygons the coordinates must run in a clockwise direction.

If some of the polygons are holes, these must run in a counterclockwise direction.

#### 15.28.8.32 shapefile.Writer.polym ( *self*, *polys*)

Creates a POLYGONM shape.

Polys is a collection of polygons, each made up of a list of xym values.

Note that for ordinary polygons the coordinates must run in a clockwise direction.

If some of the polygons are holes, these must run in a counterclockwise direction.

If the m (measure) value is not included, it defaults to None (NoData).

15.28.8.33 shapefile.Writer.polyz ( *self*, *polys*)

Creates a POLYGONZ shape.  
Polys is a collection of polygons, each made up of a list of xyzm values.  
Note that for ordinary polygons the coordinates must run in a clockwise direction.  
If some of the polygons are holes, these must run in a counterclockwise direction.  
If the z (elevation) value is not included, it defaults to 0.

If the m (measure) value is not included, it defaults to None (NoData).

15.28.8.34 shapefile.Writer.record ( *self*, \* *recordList*, \*\* *recordDict*)

Creates a dbf attribute record. You can submit either a sequence of field values or keyword arguments of field names and values. Before adding records you must add fields for the record values using the field() method. If the record values exceed the number of fields the extra ones won't be added. In the case of using keyword arguments to specify field/value pairs only fields matching the already registered fields will be added.

15.28.8.35 shapefile.Writer.shape ( *self*, *s*)

15.28.8.36 shapefile.Writer.shapeTypeName ( *self*)

15.28.8.37 shapefile.Writer.zbox ( *self*)

Returns the current z extremes for the shapefile.

## 15.28.9 Member Data Documentation

15.28.9.1 `shapefile.Writer._bbox`[protected]

15.28.9.2 `shapefile.Writer._files_to_close`[protected]

15.28.9.3 `shapefile.Writer._mbox`[protected]

15.28.9.4 `shapefile.Writer._zbox`[protected]

15.28.9.5 `shapefile.Writer.autoBalance`

15.28.9.6 `shapefile.Writer.dbf`

15.28.9.7 `shapefile.Writer.deletionFlag`

15.28.9.8 `shapefile.Writer.encoding`

15.28.9.9 `shapefile.Writer.encodingErrors`

15.28.9.10 `shapefile.Writer.fields`

15.28.9.11 `shapefile.Writer.recNum`

15.28.9.12 `shapefile.Writer.shapeType`

15.28.9.13 `shapefile.Writer.shp`

15.28.9.14 `shapefile.Writer.shpNum`

15.28.9.15 `shapefile.Writer.shx`

15.28.9.16 `shapefile.Writer.target`

15.28.9.17 The documentation for this class was generated from the following file:

- `PyshpMaster/shapefile.py`

# 16 File Documentation

## 16.1 AreaManager.py File Reference

### 16.1.1 Classes

class **AreaManager.AreaManager***This class is used to paint area grouped by.*

class **AreaManager.Corner***Defines floating point data for corner defintions.*

### 16.1.2 class AreaManager.AreaMgrSubFrameNamespaces

- namespace **AreaManager**

## 16.2 EditMathSetupFrame.py File Reference

### 16.2.1 Classes

class **EditMathSetupFrame.EditMathSetup***This class allows the user to edit the Matlab/Octave setup files to fit their environment.*

### 16.2.2 Namespaces

- namespace **EditMathSetupFrame**

## 16.3 FishMortBySpecAcc.py File Reference

### 16.3.1 Classes

class **FishMortBySpecAcc.FishMortBySpecAcc***This class is used to assist the user in defining areas of interest to assess accumulated parameters located in these areas of interest.*

### 16.3.2 Namespaces

- namespace **FishMortBySpecAcc**

## 16.4 GeoSams.py File Reference

### 16.4.1 Classes

class **GeoSams.MainApplication***This class is the parent class for the GUI.*

### 16.4.2 Namespaces

- namespace **GeoSams**

### 16.4.3 Functions

- **GeoSams.ComputeResiduals** (obsFile, gridFile, procID, retDict)
- **GeoSams.main** ()

## 16.5 Globals.py File Reference

### 16.5.1 Namespaces

- namespace **Globals**

### 16.5.2 Functions

- **Globals.DetermineUnitsScale** (desiredParam)
- **Globals.UpdateEntry** (entry, val)
- **Globals.ShowMessage** (heading, message, type='info', timeout=2500)  
*This method will display the message and then go away after the default time.*

### 16.5.3 Variables

- str **Globals.analDir** = 'Analysis'
- str **Globals.configDir** = 'Configuration'
- str **Globals.dataDir** = 'Data'
- str **Globals.gridDir** = 'Grids'
- str **Globals.interCfgDir** = 'Interpolation'
- str **Globals.resultsDir** = 'Results'
- str **Globals.shapeFileDir** = 'Shapefiles'
- str **Globals.simCfgDir** = 'Simulation'
- str **Globals.specAccCfgDir** = 'SpecialAccess'
- str **Globals.surveyDataDir** = 'OriginalData'
- list **Globals.comboTFStr** = ['T', 'F']
- list **Globals.cornerLabelArr** = ['Corner', 'Long', 'Lat ', '0.0', '0.0']
- int **Globals.frameWidth** = 400
- int **Globals.frameHeight** = 200
- int **Globals.scrollFrameHeight** = 600
- int **Globals.helpXoffset** = 700
- int **Globals.helpYoffset** = 50
- int **Globals.meters\_per\_naut\_mile** = 1852
- int **Globals.grid\_area\_sqm** = meters\_per\_naut\_mile\*\*2
- str **Globals.ABUN** = 'ABUN\_ '
- str **Globals.BIOM** = 'BIOM\_ '
- str **Globals.EBMS** = 'EBMS\_ '
- str **Globals.FEFF** = 'FEFF\_ '
- str **Globals.FMOR** = 'FMOR\_ '
- str **Globals.LAND** = 'LAND\_ '
- str **Globals.LNDW** = 'LNDW\_ '
- str **Globals.LPUE** = 'LPUE\_ '
- str **Globals.RECR** = 'RECR\_ '
- int **Globals.scrollFrameWidth** = 900
- str **Globals.geometryStr** = '920x725+10+10'

## 16.6 GrowthFrame.py File Reference

### 16.6.1 Classes

class **GrowthFrame.Growth** This class allows the user to adjust parameters used in computing scallop growth.

## 16.6.2 Namespaces

- namespace `GrowthFrame`

## 16.7 MainInputFrame.py File Reference

### 16.7.1 Classes

class `MainInputFrame.MainInput` *This class displays information about GeoSAMS simulation.*

### 16.7.2 Namespaces

- namespace `MainInputFrame`

## 16.8 PointInPolygon.py File Reference

### 16.8.1 Namespaces

- namespace `PointInPolygon`

### 16.8.2 Functions

- `PointInPolygon.PointInPolygon` (polyX, polyY, x, y, nodes)

## 16.9 PyshpMaster/shapefile.py File Reference

### 16.9.1 Classes

- class `shapefile._Array` class `shapefile.Shape`
- class `shapefile._Record`
- class `shapefile.ShapeRecord`
- class `shapefile.Shapes`
- class `shapefile.ShapeRecords`
- class `shapefile.ShapefileException`
- class `shapefile.Reader`
- class `shapefile.Writer`

### 16.9.2 Namespaces

- namespace `shapefile`

### 16.9.3 Functions

- `shapefile.b` (v, encoding='utf-8', encodingErrors='strict')
- `shapefile.u` (v, encoding='utf-8', encodingErrors='strict')
- `shapefile.is_string` (v)
- `shapefile.pathlike_obj` (path)
- `shapefile.signed_area` (coords, fast=False)
- `shapefile.is_cw` (coords)
- `shapefile.rewind` (coords)
- `shapefile.ring_bbox` (coords)
- `shapefile.bbox_overlap` (bbox1, bbox2)
- `shapefile.bbox_contains` (bbox1, bbox2)
- `shapefile.ring_contains_point` (coords, p)
- `shapefile.ring_sample` (coords, ccw=False)
- `shapefile.ring_contains_ring` (coords1, coords2)

- **shapefile.organize\_polygon\_rings** (rings, return\_errors=None)
- **shapefile.test** (\*\*kwargs)

#### 16.9.4 Variables

- **str shapefile.\_\_version\_\_** = "2.3.1"
- **shapefile.logger** = logging.getLogger(\_\_name\_\_)
- **bool shapefile.VERBOSE** = True
- **int shapefile.NULL** = 0
- **int shapefile.POINT** = 1
- **int shapefile.POLYLINE** = 3
- **int shapefile.POLYGON** = 5
- **int shapefile.MULTIPOINT** = 8
- **int shapefile.POINTZ** = 11
- **int shapefile.POLYLINEZ** = 13
- **int shapefile.POLYGONZ** = 15
- **int shapefile.MULTIPOINTZ** = 18
- **int shapefile.POINTM** = 21
- **int shapefile.POLYLINEM** = 23
- **int shapefile.POLYGONM** = 25
- **int shapefile.MULTIPOINTM** = 28
- **int shapefile.MULTIPATCH** = 31
- **dict shapefile.SHAPETYPE\_LOOKUP**
- **int shapefile.TRIANGLE\_STRIP** = 0
- **int shapefile.TRIANGLE\_FAN** = 1
- **int shapefile.OUTER\_RING** = 2
- **int shapefile.INNER\_RING** = 3
- **int shapefile.FIRST\_RING** = 4
- **int shapefile.RING** = 5
- **dict shapefile.PARTTYPE\_LOOKUP**
- **int shapefile.PYTHON3** = 3
- **shapefile.xrange** = range
- **shapefile.izip** = zip
- **list shapefile.MISSING** = [None,""]
- **int shapefile.NODATA** = -10e38
- **shapefile.failure\_count** = test()

### 16.10 ShapeTest.py File Reference

#### 16.10.1 Classes

#### 16.10.2 class ShapeTest.GeoShapeNamespaces

- namespace **ShapeTest**

#### 16.10.3 Variables

- **ShapeTest.sf** = shapefile.Reader("Shapefiles/MAB\_Estimation\_Areas\_2019\_UTM18\_PDT.shp")
- **ShapeTest.shapes** = sf.shapes()
- **ShapeTest.shapeLen** = len(sf)
- **list ShapeTest.shapeMA** = [ GeoShape() for \_ in range(shapeLen)]
- **ShapeTest.record** = sf.record(n)
- **ShapeTest.as\_dict** = record.as\_dict()
- **ShapeTest.SAMS**

- `ShapeTest.NewSAMS`
- `ShapeTest.areaKm2`
- `ShapeTest.pointLen = len(shapes[n].points)`
- `ShapeTest.X`
- `ShapeTest.Y`
- `ShapeTest.lat`
- `ShapeTest.lon`
- `list ShapeTest.shapeGB = [ GeoShape() for _ in range(shapeLen)]`

## 16.11 SortByAreaFrame.py File Reference

### 16.11.1 Classes

*class **SortByAreaFrame.SortByArea**This class is used to assist the user in defining areas of interest to assess accumulated parameters located in these areas of interest.*

### 16.11.2 Namespaces

- namespace `SortByAreaFrame`

## 16.12 SortByRegionFrame.py File Reference

### 16.12.1 Classes

*class **SortByRegionFrame.GeoShape**This class is used to define the shape of the regional data.*

*class **SortByRegionFrame.SortByRegion**This class is used to assist the user in defining areas of interest to assess accumulated parameters located in these areas of interest.*

### 16.12.2 Namespaces

- namespace `SortByRegionFrame`

## 16.13 SortIntoColumns.py File Reference

### 16.13.1 Classes

- `class SortIntoColumns.GeoShape``class SortIntoColumns.Column`

### 16.13.2 Namespaces

- namespace `SortIntoColumns`

### 16.13.3 Variables

- `SortIntoColumns.inputFile = sys.argv[1]`
- `SortIntoColumns.l = len(inputFile)`
- `SortIntoColumns.domain = inputFile[1-2:l]`
- `SortIntoColumns.dataFile = os.path.join('Data', inputFile+'.csv')`
- `SortIntoColumns.outfile = os.path.join('Data', inputFile+'_BUFFER.csv')`
- `SortIntoColumns.M = pd.read_csv(dataFile)`
- `SortIntoColumns.fileName = os.environ['GBShapeBufferFile']`
- `str SortIntoColumns.subDir = 'GB_Buffer'`
- `SortIntoColumns.shapeFile = os.path.join('Shapefiles', subDir, fileName)`
- `SortIntoColumns.sf = shapefile.Reader(shapeFile)`
- `SortIntoColumns.shapes = sf.shapes()`



- `SortIntoColumns.shapeLen = len(sf)`
- `list SortIntoColumns.shape = [ GeoShape() for _ in range(shapeLen)]`
- `SortIntoColumns.record = sf.record(n)`
- `SortIntoColumns.as_dict = record.as_dict()`
- `SortIntoColumns.Region`
- `SortIntoColumns.pointLen = len(shapes[n].points)`
- `SortIntoColumns.X`
- `SortIntoColumns.Y`
- `list SortIntoColumns.columns = [Column() for _ in range(shapeLen)]`
- `SortIntoColumns.name`
- `SortIntoColumns.X_t = M['UTM_X']`
- `SortIntoColumns.Y_t = M['UTM_Y']`
- `SortIntoColumns.rows = len(X_t)`
- `SortIntoColumns.nodes = len(shape[rgn].X)`
- `SortIntoColumns.sep`
- `SortIntoColumns.na_rep`
- `SortIntoColumns.index`

## 16.14 SpecialAreaFrame.py File Reference

### 16.14.1 Classes

`class SpecialAreaFrame.SpecialArea` This class is used to assist the user in defining areas of interest to assess accumulated parameters located in these areas of interest.

### 16.14.2 Namespaces

- namespace `SpecialAreaFrame`

## 16.15 Widgets.py File Reference

### 16.15.1 Classes

`class Widgets.SubFrameElement` Generic Element.

- `class Widgets.SubFrameInterpFunction` `class Widgets.SubFrameXY`  
Widget for XY label and entry.

`class Widgets.ScrollFrameScrollable` `Frame` `Class` `from`  
<https://gist.github.com/mp035/9f2027c3ef9172264532fcd6262f3b01>.

### 16.15.2 Namespaces

- namespace `Widgets`

### 16.15.3 Functions

- `Widgets.numbersCallback` (input)  
Allows only correctly formed positive integers, ignores non-numeric characters.
- `Widgets.floatCallback` (input)  
Allows only correctly formed floats, ignores non-numeric characters.

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