Gaia 3.4

Extenders Developer's Guide

Version 3.4.0.0013

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About The Carbon Project

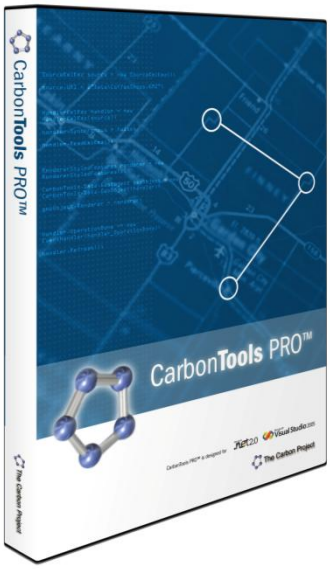
The Carbon Project® (www.TheCarbonProject.com) is an innovative, high-energy software and technology company, specializing in mapping, geospatial interoperability and geosocial solutions. Our company serves geospatial professionals, software developers, government agencies and businesses that develop mapping solutions or use geospatial data from many sources.

The Carbon Project develops mapping software solutions for government and commercial purposes. Our core clientele is in the Defense and Intelligence, Environmental and Infrastructure market sectors. Our customers include the US Department of Defense (DoD), Army Corps of Engineers, UK Ministry of Defence (UK MOD), National Geospatial Intelligence Agency (NGA), Joint Forces Command, United States Geological Survey (USGS), British Geological Survey, Canada's GeoConnections, defense integrators including BAE Systems, SRA International, and Lockheed Martin and more.

Our core suite of products includes CarbonTools™ PRO, CarbonArc® PRO, and Gaia® Extenders. These software products are provided 'off-the-shelf' to customers and users around the world.

About CarbonTools PRO

CarbonTools PRO (www.CarbonTools.com) is an extension to the Microsoft .NET Framework that supports advanced location content handling and sharing and is the foundation for the Gaia application.



Based on the Source-Handler-Data® technology, CarbonTools PRO provides a unified framework for geospatial interoperability with an array of location content and services. This means Microsoft Bing Maps, Google Earth, OpenStreetMap, Yahoo! Maps, OGC SDI, GML, GMLsf, ESRI Shapefiles and more can be used in your open-geospatial .NET applications...seamlessly!

With CarbonTools PRO, .NET developers can extend existing geospatial systems, including but not limited to Gaia, with new capabilities and content sources or build exciting new open-geospatial .NET applications. Furthermore, the package contains numerous code samples and extensive documentation, including the *complete project and source code of the latest Gaia version*.

CarbonTools PRO is now available and includes many new features to support your open-geospatial .NET development projects.

Overview

Gaia® is an open-geospatial viewer application. Based on the **CarbonTools PRO** open-geospatial development toolkit (www.CarbonTools.com), this viewer can access an array of geospatial sources such as the *Open Geospatial Consortium* (OGC) Web Mapping Service (WMS), Web Coverage Service (WCS), and Web Feature Service (WFS), commercial services such as *Microsoft Bing Maps*, *OpenStreetMap* and *Yahoo! Maps* as well as various file formats including *ESRI* Shapefiles, *Google Earth* KML/KMZ, DXF, MIF, Geography Markup Language (GML) and GML for Simple Features (GMLsf). Beginning with version 3.2 (released in mid 2008) an open Extenders API was introduced. Commercial entities, government agencies and individuals can now extend and expand Gaia with new functionalities and capabilities. Some of the API functions do not require a CarbonTools PRO developer license, others do (these will be clearly marked in this document).

The Gaia Extenders system is using the .NET reflection mechanism to define a contract between the main Gaia application and any assembly (DLL) present at the Extenders designated directory. This is a non intrusive process that does not require component registration of any kind. Once Gaia detects an assembly that implements a class named **ExtenderImplementer** the assembly is considered an Extender and will be dynamically loaded and used. Once the Extender is read it will be listed in the Extenders management tool. Through the .NET reflection mechanism Gaia will look for specific API commands by name and type and implement their functionality as needed. The user may elect to disregard an Extender by un-checking it in the Extenders management form. This will prevent the corresponding assembly from being loaded by Gaia in future sessions.

Extenders can perform a variety of functions within Gaia. They can define new data types to be used by Gaia. They can construct new tools that are activated from added toolbars and controls. Extenders can also alter Gaia's look and feel by adding new user interface components or changing the behavior of existing ones.

Due to the multi-threaded nature of Gaia, where many functions are performed a-synchronously, some external operations must be addressed via event handlers. To ease the interaction with Gaia and ensure coherency and consistency of the various data types and event handlers a shared assembly named **Gaia.ExtenderHelper.dll** is available and should be referenced by the Extender. This assembly defines two event handlers and related data structures. One handler is used for events generated by Gaia and captured by the Extender, for example a change in the viewed world coordinates. This event handler can be used to perform functions related to raised events using internal callbacks. The second handler is for events that are raised by the Extender and are captured and handled by Gaia, for example centering the map or adding a new layer.

Simple Extender Code

This C# code sample shows how a very basic extender should be implemented. Compiling an assembly containing this class and placing the resulting DLL in the Gaia directory, where Gaia.exe is found, will result in this DLL being loaded as an extender, showing the specified name and description in the form opened via the File→Extenders menu command. Note there are no restrictions on the namespace name as Gaia looks for the **ExtenderImplementer** class by name alone, disregarding the namespace. It is important to note that ExtenderImplementer should be used only once per extender.

```
namespace GaiaExtender_Sample
{
    class ExtenderImplementer
    {
        public string Name
        {
            get { return "My Extender"; }
        }

        public string Description
        {
            get { return "This extender does something"; }
        }
    }
}
```

Extenders API Methods and properties

Legend

A property is marked with a brown background for the table header:

Property Name

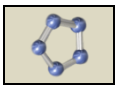
A method is marked with a dark-blue background for the table header:

Method Name

An event is marked with a dark-purple background for the table header and the title shows the handler supporting the event and the event name separated with a dot:

Handler.Event Name

Properties or methods that require a CarbonTools PRO developer license are marked with The Carbon Project logo (for more information about CarbonTools PRO please visit: www.CarbonTools.com):



Code samples appear in Visual Studio color scheme on a light-gray background:

```
public string Name
{
    get { return "My Extender"; }
}
```

Syntax

Note that the functions names are from Gaia's perspective so a method that begins with "*Set*" means that Gaia sets a value for the Extender to read. A "*Get*" type method means the Extender is sending something to Gaia. Methods that start with "*On*" are meant to activate certain Gaia functionality via an associated event.

General Purpose

Description	
Expected return types	string
A property that gets the description for the Extender. This text appears as the description text shown when viewing the extenders list form in Gaia.	

```
public string Description
{
    get { return "This extender does something"; }
}
```

GaiaVersion	
Expected type	string
Gaia populates this property with its current assembly version. This value is useful when deploying extenders that implement functionality (or extender API) that is valid from a certain Gaia version, and will not work on a lower version. The extender can verify the Gaia version and perform its functionality accordingly, e.g. pop an error message. Gaia version consists of a dot-separated major, minor and build version (e.g. “3.2.2”).	

```
public string GaiaVersion { get; set; }

// Return true if the Gaia version is equal or higher than 3.2.2
bool VerifyGaiaVersion()
{
    if (String.IsNullOrEmpty(GaiaVersion)) return false;

    string[] verParts = GaiaVersion.Split(new char[] { '.' });
    if (verParts.Length != 4) return false;
    int v1 = int.Parse(verParts[0]);
    if (v1 > 3) return true;
    if (v1 < 3) return false;

    int v2 = int.Parse(verParts[1]);
    if (v2 > 2) return true;
    if (v2 < 2) return false;

    int v3 = int.Parse(verParts[2]);
    if (v3 >= 2) return true;
    return false;
}
```

SetExtendersImplementers	
Parameters	Dictionary<string, object[]> extenders
Expected return types	none

Returns Gaia's list of loaded extenders as a dictionary with the assemblies' names as the key and an object array. The object array value always has the size of 2 where the first value is the Extender Instance object and the second is the ExtenderImplementer Type retrieved by Gaia.
This method is used to create dynamic linkage between individual Extenders. For example, a geometry snapping tool can be referenced and used by various Extenders using feature digitizing tools.

```
public void SetExtendersImplementers(Dictionary<string, object[]> extenders)
{
    if (extenders.ContainsKey("GaiaExtender_GeometryEdit_SnapTools"))
    {
      object[] o = extenders["GaiaExtender_GeometryEdit_SnapTools"];
      GlobalData.SnapExtenderInstance = o[0];
      GlobalData.SnapExtenderImplementer = o[1] as Type;
    }
}

//  Enable or disable the 'Snap to Any' button on the snap Extender
public static void SetSnapToAny(bool enabled)
{
    GlobalData.SnapExtenderImplementer.InvokeMember("SnapToAllEnabled",
        BindingFlags.Default | BindingFlags.SetProperty | BindingFlags.Instance |
        BindingFlags.Public, null, GlobalData.SnapExtenderInstance,
        new object[] { enabled });
}
```

Name	
Expected type	string

A property that gets the name for the Extender. This text appears as the name of the module in the extenders list form shown by Gaia.

```
public string Name
{
    get { return "My Extender"; }
}
```

GetBottomToolStripPanelTools	
Parameters	none
Expected return types	System.Windows.Forms.ToolStrip List< System.Windows.Forms.ToolStrip>
Add tools to the bottom tool strip	

```
ToolStripButton toolStripButtonNew;
ToolStrip toolStripNew;

public ToolStrip GetBottomToolStripPanelTools()
{
    this.toolStripNew = new ToolStrip();
    this.toolStripButtonNew = new ToolStripButton();

    //  Add the button to the tool strip
    this.toolStripNew.Items.AddRange(new ToolStripItem[]
                                        { this.toolStripButtonNew });

    // Set the new button
    this.toolStripButtonNew.Image = Bitmap.FromFile("MyNewButton.bmp");
    this.toolStripButtonNew.Size = new System.Drawing.Size(22, 22);
    this.toolStripButtonNew.ToolTipText = "This is my new tool";
    this.toolStripButtonNew.Click +=
                          new System.EventHandler(toolStripButtonNew_Click);

    return toolStripNew;
}

void toolStripButtonNew_Click(object sender, System.EventArgs e)
{
    // Do something new
}
```

GetLeftToolStripPanelTools	
Parameters	none
Expected return types	System.Windows.Forms.ToolStrip List< System.Windows.Forms.ToolStrip>
Add tools to the left tool strip	

```
ToolStripButton toolStripButtonNew;
ToolStrip toolStripNew;

public ToolStrip GetLeftToolStripPanelTools()
{
    this.toolStripNew = new ToolStrip();
    this.toolStripButtonNew = new ToolStripButton();

    //  Add the button to the tool strip
    this.toolStripNew.Items.AddRange(new ToolStripItem[]
                                        { this.toolStripButtonNew });

    // Set the new button
    this.toolStripButtonNew.Image = Bitmap.FromFile("MyNewButton.bmp");
    this.toolStripButtonNew.Size = new System.Drawing.Size(22, 22);
    this.toolStripButtonNew.ToolTipText = "This is my new tool";
    this.toolStripButtonNew.Click +=
                          new System.EventHandler(toolStripButtonNew_Click);

    return toolStripNew;
}

void toolStripButtonNew_Click(object sender, System.EventArgs e)
{
    // Do something new
}
```

GetMenuStripItems	
Parameters	none
Expected return types	System.Windows.Forms.ToolStripMenuItem List< System.Windows.Forms.ToolStripMenuItem >

Add menu item to the main menu bar.
Note that the new items will be added before the “Help” menu item (which always shows last).

```
ToolStripMenuItem item1ToolStripMenuItem;
ToolStripMenuItem item2ToolStripMenuItem;

public ToolStripMenuItem GetMenuStripItems()
{
    ToolStripMenuItem newToolStripMenuItem = new ToolStripMenuItem("New Menu Item");
    item1ToolStripMenuItem = new ToolStripMenuItem("Option 1");
    item2ToolStripMenuItem = new ToolStripMenuItem("Option 2");
    newToolStripMenuItem.DropDownItems.AddRange(new ToolStripItem[]
                                { item1ToolStripMenuItem, item2ToolStripMenuItem });

    item1ToolStripMenuItem.CheckOnClick = true;
    item2ToolStripMenuItem.CheckOnClick = true;

    item1ToolStripMenuItem.CheckedChanged +=
                            new EventHandler(item1ToolStripMenuItem_CheckedChanged);
    item2ToolStripMenuItem.CheckedChanged +=
                            new EventHandler(item2ToolStripMenuItem_CheckedChanged);

    return newToolStripMenuItem;
}
```

GetRightToolStripPanelTools	
Parameters	none
Expected return types	System.Windows.Forms.ToolStrip List< System.Windows.Forms.ToolStrip>
Add tools to the right tool strip	

```
ToolStripButton toolStripButtonNew;
ToolStrip toolStripNew;

public ToolStrip GetRightToolStripPanelTools()
{
    this.toolStripNew = new ToolStrip();
    this.toolStripButtonNew = new ToolStripButton();

    //  Add the button to the tool strip
    this.toolStripNew.Items.AddRange(new ToolStripItem[]
                                        { this.toolStripButtonNew });

    // Set the new button
    this.toolStripButtonNew.Image = Bitmap.FromFile("MyNewButton.bmp");
    this.toolStripButtonNew.Size = new System.Drawing.Size(22, 22);
    this.toolStripButtonNew.ToolTipText = "This is my new tool";
    this.toolStripButtonNew.Click +=
                          new System.EventHandler(toolStripButtonNew_Click);

    return toolStripNew;
}

void toolStripButtonNew_Click(object sender, System.EventArgs e)
{
    // Do something new
}
```

GetStatusStripTools	
Parameters	none
Expected return types	System.Windows.Forms.ToolStripItem List< System.Windows.Forms.ToolStripItem>
Add tools to the status strip	

```
ToolStripStatusLabel toolStripNew;
private System.Windows.Forms.ToolStripDropDownButton toolStripDropDownButton1;
private System.Windows.Forms.ToolStripMenuItem item1ToolStripMenuItem;
private System.Windows.Forms.ToolStripMenuItem item2ToolStripMenuItem;

// Add a tool strip with text and a drop-down button to the Gaia status strip
public List<ToolStripItem> GetStatusStripTools()
{
    this.toolStripNew = new ToolStripStatusLabel();
    this.toolStripDropDownButton1 = new ToolStripDropDownButton();
    this.item2ToolStripMenuItem = new ToolStripMenuItem();
    this.item1ToolStripMenuItem = new ToolStripMenuItem();

    this.toolStripNew.BorderStyle = Border3DStyle.Flat;
    this.toolStripNew.Visible = true;
    this.toolStripNew.Text = "New status strip item";

    this.toolStripDropDownButton1.DisplayStyle = ToolStripItemDisplayStyle.Image;
    this.toolStripDropDownButton1.DropDownItems.AddRange(
        new System.Windows.Forms.ToolStripItem[] {
            this.item1ToolStripMenuItem, this.item2ToolStripMenuItem});
    this.toolStripDropDownButton1.Text = "";
    this.toolStripDropDownButton1.Name = "toolStripDropDownButton1";
    this.toolStripDropDownButton1.Size = new System.Drawing.Size(45, 20);
    this.toolStripDropDownButton1.Text = "toolStripDropDownButton1";

    this.item2ToolStripMenuItem.Name = "item1ToolStripMenuItem";
    this.item2ToolStripMenuItem.Size = new System.Drawing.Size(152, 22);
    this.item2ToolStripMenuItem.Text = "Option 1";
    this.item2ToolStripMenuItem.Click +=
        new System.EventHandler(this.item1ToolStripMenuItem_Click);

    this.item1ToolStripMenuItem.Name = "item2ToolStripMenuItem";
    this.item1ToolStripMenuItem.Size = new System.Drawing.Size(152, 22);
    this.item1ToolStripMenuItem.Text = "Option 2";
    this.item1ToolStripMenuItem.Click +=
        new System.EventHandler(this.item2ToolStripMenuItem_Click);

    List<ToolStripItem> tools = new List<ToolStripItem>(2);
    tools.Add(this.toolStripNew);
    tools.Add(toolStripDropDownButton1);

    return tools;
}
```

GetTopToolStripPanelTools	
Parameters	none
Expected return types	System.Windows.Forms.ToolStrip List< System.Windows.Forms.ToolStrip>
Add tools to the top tool strip	

```
ToolStripButton toolStripButtonNew;
ToolStrip toolStripNew;

public ToolStrip GetTopToolStripPanelTools()
{
    this.toolStripNew = new ToolStrip();
    this.toolStripButtonNew = new ToolStripButton();

    //  Add the button to the tool strip
    this.toolStripNew.Items.AddRange(new ToolStripItem[]
                                        { this.toolStripButtonNew });

    // Set the new button
    this.toolStripButtonNew.Image = Bitmap.FromFile("MyNewButton.bmp");
    this.toolStripButtonNew.Size = new System.Drawing.Size(22, 22);
    this.toolStripButtonNew.ToolTipText = "This is my new tool";
    this.toolStripButtonNew.Click +=
                          new System.EventHandler(toolStripButtonNew_Click);

    return toolStripNew;
}

void toolStripButtonNew_Click(object sender, System.EventArgs e)
{
    // Do something new
}
```

MapBackgroundColor	
Expected type	System.Drawing.Color
Sets the Gaia map's default map surface background color (existing default is white).	

```
public Color MapBackgroundColor
{
    get { return Color.Black; }
}
```

OverridingSplashImage	
Expected type	System.Drawing.Image
Sets an image that replaces the splash image that appears on the map control if no layers exist in the map. Notice that only one extender can override the splash image, the first extender loaded by Gaia that implements the *OverridingSplashImage* will be used. Any additional extenders implementing the property will be ignored. The extender may set to **null** to use a blank image.	

```
public Image OverridingSplashImage
{
    get { return Bitmap.FromFile("MyNewGaiaSplash.PNG"); }
}
```

SetLayersPanel	
Parameters	*System.Windows.Forms.SplitContainer splitPanel* The split container control holding the Layers and Notes controls
Expected return types	None
Sets Gaia's side **SplitContainer** control that holds the layers and notes panels. This panel is docked to the left of the map control by default. This panel's visibility can be changed by the user using the "View" menu items.	

```
Panel gaiaLayersPanel;

public void SetLegendPanel(Panel gaiaLayersPanel)
{ this.gaiaLayersPanel = gaiaLayersPanel; }
```

SetLegendPanel	
Parameters	*System.Windows.Forms.Panel panel* The Panel control containing the Legend control
Expected return types	none
Sets Gaia's side **Panel** that contains the Legend. Originally this panel is docked to the right of the map view. This panel's visibility can be changed by the user using the "View" menu items.	

```
Panel gaiaLegendPanel;

public void SetLegendPanel(Panel gaiaLegendPanel)
{ this.gaiaLegendPanel = gaiaLegendPanel; }
```

SetMainForm	
Parameters	*System.Windows.Forms.Form gaiaMainForm* The main Form object of the Gaia application
Expected return types	none
Sets Gaia's main **Form** object.	

```
// Add a side panel to the Gaia main form
public void SetMainForm(Form gaiaMain)
{
    gaiaMain = gaiaMain;
    gaiaMain.Controls.Add(this.sidePanel);
    this.sidePanel.SendToBack();
}
```

SetMainMapPanel	
Parameters	*System.Windows.Forms.Panel panel* The Panel control containing the main ToolStripContainer and map
Expected return types	none
Sets Gaia's Panel that contains the **ToolStripContainer** around the map control.	

```
Panel gaiaMainMapPanel;

public void SetMainMapPanel(Panel gaiaMainMapPanel)
{ this.gaiaMainMapPanel = gaiaMainMapPanel; }
```

SetMenuStrip	
Parameters	*System.Windows.Forms.MenuStrip menuStrip* The MenuStrip control in Gaia
Expected return types	none

Sets Gaia's **StatusStrip** that contains all the tools in the status bar. The returned value contains all tools, including those pushed by other extenders (e.g. using **GetStatusStripTools**).

```
ToolStripMenuItem newConfigToolStripMenuItem;
// Add a new separator and item to Gaia's Tools->Configuration menu item
public void SetMenuStrip(MenuStrip gaiaMenuStrip)
{
    ToolStripItem[] configs =
            gaiaMenuStrip.Items.Find("configurationToolStripMenuItem",
            true);
    if (configs.Length == 0 || !(configs[0] is ToolStripMenuItem)) return;

    this.newConfigToolStripMenuItem = new ToolStripMenuItem(
        "My new config",
        null,
        new System.EventHandler(
            this.newConfigToolStripMenuItem_Click),
            "newConfigToolStripMenuItem");

    ((ToolStripMenuItem)configs[0]).DropDownItems.Add(new ToolStripSeparator());
    ((ToolStripMenuItem)configs[0]).DropDownItems.Add(newConfigToolStripMenuItem);
}
```

SetStatusStrip	
Parameters	*System.Windows.Forms.StatusStrip statusStrip* The StatusStrip control in Gaia
Expected return types	none

Sets Gaia's **StatusStrip** that contains all the tools in the status bar. The returned value contains all tools, including those pushed by other extenders (e.g. using **GetStatusStripTools**)

```
ToolStripStatusLabel gaiaStatuslabel;
public void SetStatusStrip(StatusStrip gaiaStatusStrip)
{
    gaiaStatuslabel = gaiaStatusStrip.Items[0] as ToolStripStatusLabel;
}
```

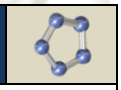
SetToolStripContainer	
Parameters	*System.Windows.Forms.ToolStripContainer toolStrip* The ToolStripContainer control surrounding the map view in Gaia
Expected return types	none

Sets Gaia's **ToolStripContainer** that contains all the tool bars around the map control. The returned value contains all tools, including those pushed by other extenders (e.g. using **GetTopToolStripPanelTools**)

```
ToolStripButton toolStripButtonNew;
ToolStrip toolStripNew;
// Add a toolstip to to Gaia's top tool-strip panel
public void SetToolStripContainer(ToolStripContainer gaiaToolsStripContainer)
{
    this.toolStripNew = new ToolStrip();
    this.toolStripButtonNew = new ToolStripButton();

    //  Add the button to the tool strip
    this.toolStripNew.Items.AddRange(new ToolStripItem[] { this.toolStripButtonNew });

    // Set the new button
    this.toolStripButtonNew.Image = Bitmap.FromFile("MyNewButton.bmp");
    this.toolStripButtonNew.Size = new System.Drawing.Size(22, 22);
    this.toolStripButtonNew.ToolTipText = "This is my new tool";
    this.toolStripButtonNew.Click +=
                          new System.EventHandler(toolStripButtonNew_Click);

    gaiaToolsStripContainer.TopToolStripPanel.Controls.Add(toolStripNew);
}
```

CarbonTools PRO Based Calls

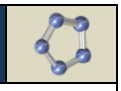
Getting Gaia's CarbonTools based Controls

SetLayersContainer	
Parameters	*CarbonTools.Windows.Forms.LayersContainer layersContainer* The layers container control used by Gaia
Expected return types	none

Sets Gaia's main **LayersContainer** control that contains all map layers.

Note: requires CarbonTools PRO developer license

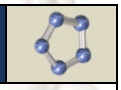
```
public void SetLayersContainer(LayersContainer gaiaLayersContainer)
{
    this.gaiaLayersContainer = gaiaLayersContainer;
}
```

SetMultiMap	
Parameters	*CarbonTools.Windows.Forms.MultiMap map* The main map control
Expected return types	none

Sets Gaia's main **MultiMap** control that contains all map layers.

Note: requires CarbonTools PRO developer license

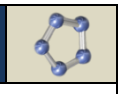
```
public void SetMultiMap(MultiMap gaiaMultiMap)
{
    this.gaiaMultiMap = gaiaMultiMap;
}
```

SetNotesContainer	
Parameters	*CarbonTools.Windows.Forms.NotesContainer notesContainer* The notes container control used by Gaia
Expected return types	none

Sets Gaia's main **NotesContainer** control that contains all user notes.

Note: requires CarbonTools PRO developer license

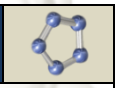
```
public void SetNotesContainer(NotesContainer gaiaNotesContainer)
{
    this.gaiaNotesContainer = gaiaNotesContainer;
}
```

SetNotesSymbolSelectorDialog	
Parameters	*CarbonTools.Windows.Forms.SymbolSelectorDialog symbolSelector* The notes pushpin symbol selector dialog used by Gaia
Expected return types	none

Sets the pushpin symbol selection dialog used by Gaia when adding or editing notes. This dialog is activated via the note editor to select the pushpin style.

Note: requires CarbonTools PRO developer license

```
SymbolLibrary library;
SymbolSelectorDialog gaiaNotesSymbolSelector;

// Set a new symbol library to the notes pushpin Symbol Selector
public void SetNotesSymbolSelectorDialog(SymbolSelectorDialog symbolSelector)
{
    symbolSelector.SymbolLibrary = this.library;
    this.gaiaNotesSymbolSelector = symbolSelector;
}
```

SetSymbolSelectorDialog	
Parameters	*CarbonTools.Windows.Forms.SymbolSelectorDialog symbolSelector* The features symbol selector dialog used by Gaia
Expected return types	none

Sets the features symbol selection dialog used by Gaia. This dialog is used in the feature layer properties as well as when double clicking on the legend or a layer's thumbnail.

Note: requires CarbonTools PRO developer license

```
SymbolLibrary library;
SymbolSelectorDialog gaiaSymbolSelector;

// Set a new symbol library to the features Symbol Selector
public void SetSymbolSelectorDialog(SymbolSelectorDialog symbolSelector)
{
    symbolSelector.SymbolLibrary = this.library;
    this.gaiaSymbolSelector = symbolSelector;
}
```

Modifying the Layer Info Tool

These methods allow modification of the "Layer Info" dialog, allowing for new data sources or modified source behavior to affect the information view.

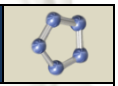
GetFeaturesInfoPanel	
Parameters	*CarbonTools.Data.GeoObject layer* The layer selected by the user in the Info dialog *double worldX, worldY* The world coordinates of the info event as selected by the user. *CarbonTools.Content.Features.ItemList features* The features in the *layer* that match the user selection
Expected return types	*System.Windows.Forms.Control*

This method allows the extender to override the displayed information regarding a features based layer when using the "Info" tool. The returned Control will be displayed in the Info dialog. The extender should inspect the layer and decide whether it is appropriate to override the default Gaia display and return the custom display; otherwise the method should return **null** and allow Gaia to use the internal display.

Gaia will populate the *features* list with items that match the user's selection from the selected *layer*. This saves the user the effort of inspecting manually the complete features set.

Note: requires CarbonTools PRO developer license

```
public Control GetFeaturesInfoPanel(GeoObject go, double worldX, double worldY,
                                    ItemList features)
{
    if (features.Count == 0 || !(features[0] is MyFeatureClass)) return null;

    return new MyFeaturesLayerInfoPanel(features);
}
```

GetLayerInfoPanel	
Parameters	*CarbonTools.Data.GeoObject layer* The layer selected by the user in the Info dialog *double worldX, worldY* The world coordinates of the info event as selected by the user.
Expected return types	*System.Windows.Forms.Control*

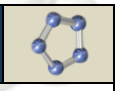
This method allows the extender to override the displayed information regarding a layer when using the "Info" tool. The returned Control will be displayed in the Info dialog. The extender should inspect the layer and decide whether it is appropriate to override the default Gaia display and return the custom display; otherwise the method should return **null** and allow Gaia to use the internal display.

Note: requires CarbonTools PRO developer license

```
public Control GetLayerInfoPanel(GeoObject go, double worldX, double worldY)
{
    if (!(go.Handler is HandlerWMS)) return null;

    return new MyWMSInfoPanel(go);
}
```

Modifying the Layer Properties View

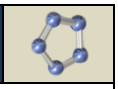
These methods allow the modification of the layers "Properties" panel, allowing for new data sources or modified source behavior to affect the properties tabular view.

AcceptLayerProperty	
Parameters	*CarbonTools.Data.GeoObject layer* The layer displayed in the properties.
Expected return types	*Bool* **True** if the Extender overrides the default tabs for the layer; **false** if the default tabs should be used in conjunction with the new functionality.

This method allows performing operations prior to Gaia setting the property tabs for the layer.
This method is called before setting the default tabs. In case the method returns **true** the default property tabs will not be displayed.

Note: requires CarbonTools PRO developer license

```
public void AcceptLayerProperty (GeoObject go)
{
    SourceWFS source = _handler.Source as SourceWFS;
    source.FilterString = "";
}
```

AcceptLayerPropertyFinal	
Parameters	*CarbonTools.Data.GeoObject layer* The layer displayed in the properties.
Expected return types	none

This method allows performing operations after Gaia sets the property tabs for the layer.

Note: requires CarbonTools PRO developer license

```
public void AcceptLayerPropertyFinal(GeoObject go)
{
    SourceWFS source = _handler.Source as SourceWFS;

   if (String.IsNullOrEmpty(source.Namespaces) ||
       source.Namespaces.IndexOf("xmlns:fes=") < 0)
       source.Namespaces += " xmlns:fes=\"http://www.opengis.net/fes/2.0\"";
}
```

GetLayerPropertyCustomPages	
Parameters	*CarbonTools.Data.GeoObject layer* The layer displayed in the properties.
Expected return types	*TabPage[]* An array of tap pages to add. Return **null** if no pages should be added.

This method allows the Extender to add customized tab pages to be added to the layer's "Properties" page.

Note: requires CarbonTools PRO developer license

```
public TabPage[] GetLayerPropertyCustomPages(GeoObject go)
{
    if (go.Handler is HandlerWFS)
    {
        PropertyPageTemporalFiltering page = new PropertyPageTemporalFiltering(go);

        return new TabPage[] { page as TabPage };
    }
    else
        return null;
}
```

GetLayerPropertyPanelNames	
Parameters	*CarbonTools.Data.GeoObject layer* The layer displayed in the properties.
Expected return types	*string[]* An array of tap pages to add. Return **null** if no pages should be added.

This method allows fine-tuning which of the default tabs should be used in the "Properties" page. The Extender should return a list of tab names from: "query", "extents", "filters", "style", "symbols", "labels", "temporal", and "security". Only the selected tabs will appear.

Note: requires CarbonTools PRO developer license

```
public string[] GetLayerPropertyPanelNames(GeoObject go)
{
    if (go.Handler is HandlerWFS_New)
        return new string[] { "query", "extents", "filters", "symbols", "labels",
                              "temporal", "security" };
    else
        return null;
}
```

Events

Note: In order to use Gaia's events handling you must reference Gaia.ExtednerHelper.dll in your project. This assembly is available under the Gaia installed folder.

Event Handlers

GaiaToExtenderEventsHandler
An event handler created by Gaia and used to report events relating to Gaia's functionality. This property is used to get a reference by extenders to the events handler initiated and managed by Gaia. Once attached by the extender callbacks can be handled by the extender. ***Supported events:*** **SetMouseLocation**: Get the coordinates according to a mouse-move event. **SetMapBBox**: Get the viewed bounding-box after the map's region changes (e.g. due to zoom or pan) **SessionLoaded**: Indicates that a new session files was initiated

ExtenderToGaiaEventsHandler
An event handler created by Gaia and used to hook events triggered by the extender. This property is used to get a reference by extenders to the events handler initiated and managed by Gaia. Once attached by the extender callbacks within Gaia can be triggered by the extender. ***Supported events:*** **OnAddFile** : Adds a spatial layer from a file. **OnAddGeoObject** : Adds a spatial layer from a CarbonTools GeoObject class. **OnChangeCenterMap :** Center the map on the given location. **OnChangeMapBBox** : Set the map to the given region. **OnLoadInsertSession** : Insert a new GSF to current session. **OnLoadSession** : Load a new GSF. **OnMarkSessionAsUnsaved** : Instruct Gaia to mark the current session as unsaved. **OnRefreshAllLayers** : Refresh all the layers in the session. **OnRefershLayer** : Refresh a specific layer. **OnRemoveGeoObject** : Remove a layer from session according to its CarbonTools GeoObject. **OnStartNewSession** – Instruct Gaia to start a fresh session.

SetMouseLocation	
Event Type	*EventHandler<Gaia.ExtenderHelper.PositionEventArgs>*
Update the extension with a location of the cursor on the map. This event is triggered by a mouse move over the map control.	

```
private GaiaToExtenderEvents gaiaToExtenderEventsHandler;
public GaiaToExtenderEvents GaiaToExtenderEventsHandler
{
    set
    {
        this.gaiaToExtenderEventsHandler = value;
        this.gaiaToExtenderEventsHandler.SetMouseLocation +=
                new EventHandler<PositionEventArgs>(SetMouseLocation);
    }
}

void SetMouseLocation(object sender, PositionEventArgs e)
{  // Do something where e.X, e.Y are the world coordinates of the mouse
}
```

SetMapBBox	
Event Type	*EventHandler<Gaia.ExtenderHelper.BBoxEventArgs>*
Update the bounding box region of the map. This method is activated every time the map region changes, usually due to a pan or zoom event.	

```
private GaiaToExtenderEvents gaiaToExtenderEventsHandler;
public GaiaToExtenderEvents GaiaToExtenderEventsHandler
{
    set
    {
        this.gaiaToExtenderEventsHandler = value;
        this.gaiaToExtenderEventsHandler.SetMapBBox +=
            new EventHandler<BBoxEventArgs>(SetMapBBox);
    }
}

void SetMapBBox(object sender, BBoxEventArgs e)
{   // Do something where e.X0, e.Y0, e.X1, e.Y1, e.SRS are the region coordinates
}
```

SessionLoaded	
Event Type	*EventHandler<Gaia.ExtenderHelper.FileNameEventArgs>*
This event is raised when a new Gaia session was loaded.	

```
private GaiaToExtenderEvents gaiaToExtenderEventsHandler;

public GaiaToExtenderEvents GaiaToExtenderEventsHandler
{
    set
    {
        this.gaiaToExtenderEventsHandler = value;
        this.gaiaToExtenderEventsHandler. SessionLoaded +=
            new EventHandler<FileNameEventArgs>( SessionLoaded );
    }
}

void SessionLoaded(object sender, FileNameEventArgs e)
{   // Do something where e.Filename is the new session's file name
}
```

OnAddFile	
Parameters	*Gaia.ExtenderHelper.FileNameEventArgs filename* The file name that Gaia should add
Expected return types	none

Instruct Gaia to add a layer based on a file according to its name and title. The title is an optional text used in the layers legend as a human readable title for the layer.
Gaia will recognize the file type according to its extension, supported extensions are:

GML: gml, gml2, gml3, gml3_2
Shapefiles: shp, shx, dbf
MapInfo: mif
Autodesk: dxf
GoogleEarth: kml, kmz

```
public ExtenderToGaiaEvents ExtenderToGaiaEventsHandler { get; set; }

private void AddLayerFromFile(string filename, double title)
{
    ExtenderToGaiaEventsHandler.OnAddFile(new FileNameEventArgs(filename, title));
}
```

OnAddGeoObject	
Parameters	*Gaia.ExtenderHelper.ObjectEventArgs geoObject* An object containing a CarbonTools.Data.GeoObject class
Expected return types	none

Instruct Gaia to add a layer using a **GeoObject** class. A CarbonTools **GeoObject** class can contain handler, data, renderers and other information about the added layer.

Note: requires CarbonTools PRO developer license

```
public ExtenderToGaiaEvents ExtenderToGaiaEventsHandler { get; set; }

private void AddLayer (GeoObject go)
{
     ExtenderToGaiaEventsHandler.OnAddGeoObject(new ObjectEventArgs(go));
}
```

OnChangeCenterMap	
Parameters	*Gaia.ExtenderHelper.PositionEventArgs pos* The location on which the map should center on
Expected return types	none
Request Gaia to center the map according to a given position.	

```
public ExtenderToGaiaEvents ExtenderToGaiaEventsHandler { get; set; }

private void SetMapToLocation(double lat, double lon)
{
    ExtenderToGaiaEventsHandler.OnChangeCenterMap(new PositionEventArgs(lon, lat));
}
```

OnChangeMapBBox	
Parameters	*Gaia.ExtenderHelper.BBoxEventArgs bbox* The region on which the map should center on
Expected return types	none
Request Gaia to center the map according to a given bounding-box region.	

```
public ExtenderToGaiaEvents ExtenderToGaiaEventsHandler { get; set; }

private void SetMapToRegion(double lat0, double lon0, double lat1, double lon1)
{
    ExtenderToGaiaEventsHandler.OnChangeMapBBox(
                    new BBoxEventArgs(lon0, lat0, lon1, lat1, "EPSG:4326"));
}
```

OnLoadInsertSession	
Parameters	*Gaia.ExtenderHelper.FileNameEventArgs args* The session file name to import
Expected return types	none
Request Gaia to import a session file into the current session.	

```
public ExtenderToGaiaEvents ExtenderToGaiaEventsHandler { get; set; }

private void ImportGsf()
{
    ExtenderToGaiaEventsHandler. OnLoadInsertSession (
                    new FileNameEventArgs("MySessionNotes.gsf"));
}
```

OnLoadSession	
Parameters	*Gaia.ExtenderHelper.FileNameEventArgs args* The session file name to load
Expected return types	none
Request Gaia to load a session file and discard the current session.	

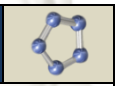
```
public ExtenderToGaiaEvents ExtenderToGaiaEventsHandler { get; set; }

private void LoadGsf()
{
    ExtenderToGaiaEventsHandler. OnLoadSession (
                    new FileNameEventArgs("BaseMaps.gsf"));
}
```

OnMarkSessionAsUnsaved	
Parameters	none
Expected return types	none
Instruct Gaia to mark the current session as “dirty”, thus enabling the “Save” menu item and popping the save session verification when the session is closed.	

```
public ExtenderToGaiaEvents ExtenderToGaiaEventsHandler { get; set; }

private void MarkSessionAsUnsaved()
{
    ExtenderToGaiaEventsHandler. OnMarkSessionAsUnsaved();
}
```

OnRefreshAllLayers	
Parameters	none
Expected return types	none
Instruct Gaia to perform the “Refresh All” function.	

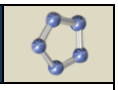
```
public ExtenderToGaiaEvents ExtenderToGaiaEventsHandler { get; set; }

private void OnRefreshAllLayers()
{
    ExtenderToGaiaEventsHandler.OnRefreshAllLayers();
}
```

OnRefershLayer	
Parameters	*Gaia.ExtenderHelper.ObjectEventArgs geoObject* An object containing a CarbonTools.Data.GeoObject class
Expected return types	none

Instruct Gaia to refresh a specific layer in the session.

Note: requires CarbonTools PRO developer license

```
public ExtenderToGaiaEvents ExtenderToGaiaEventsHandler { get; set; }

private void RefreshLayer(GeoObject go)
{
    ExtenderToGaiaEventsHandler.OnRefreshLayer(new ObjectEventArgs(go));
}
```

OnRemoveGeoObject	
Parameters	*Gaia.ExtenderHelper.ObjectEventArgs geoObject* An object containing a CarbonTools.Data.GeoObject class
Expected return types	none

Instruct Gaia to remove a layer from the session.

Note: requires CarbonTools PRO developer license

```
public ExtenderToGaiaEvents ExtenderToGaiaEventsHandler { get; set; }

private void RemoveLayer(GeoObject go)
{
    ExtenderToGaiaEventsHandler.OnRemoveGeoObject(new ObjectEventArgs(go));
}
```

OnStartNewSession	
Parameters	none
Expected return types	none
Instruct Gaia to start a new session.	

```
public ExtenderToGaiaEvents ExtenderToGaiaEventsHandler { get; set; }

private void StartNew()
{
    ExtenderToGaiaEventsHandler.OnStartNewSession();
}
```