ArcObjects VC++开发插件教程

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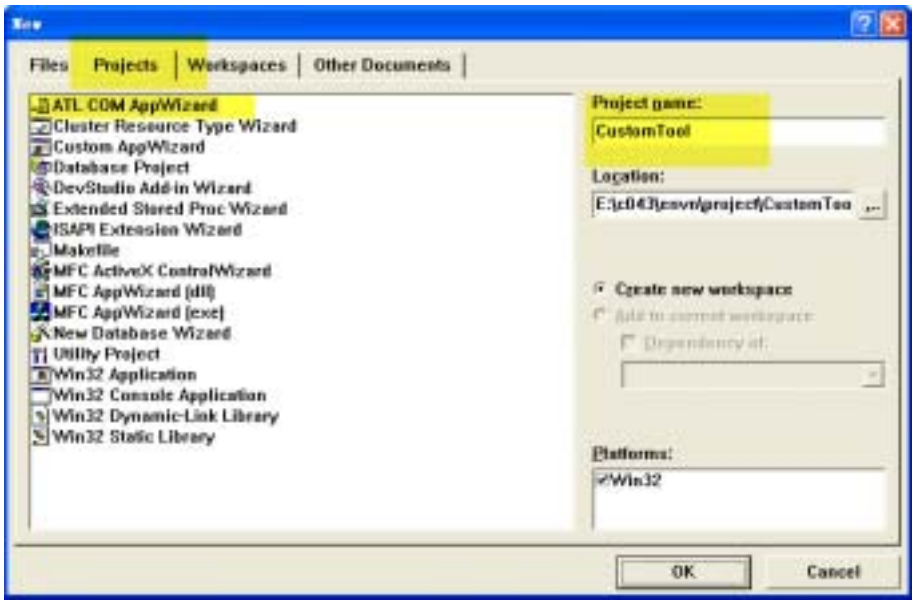
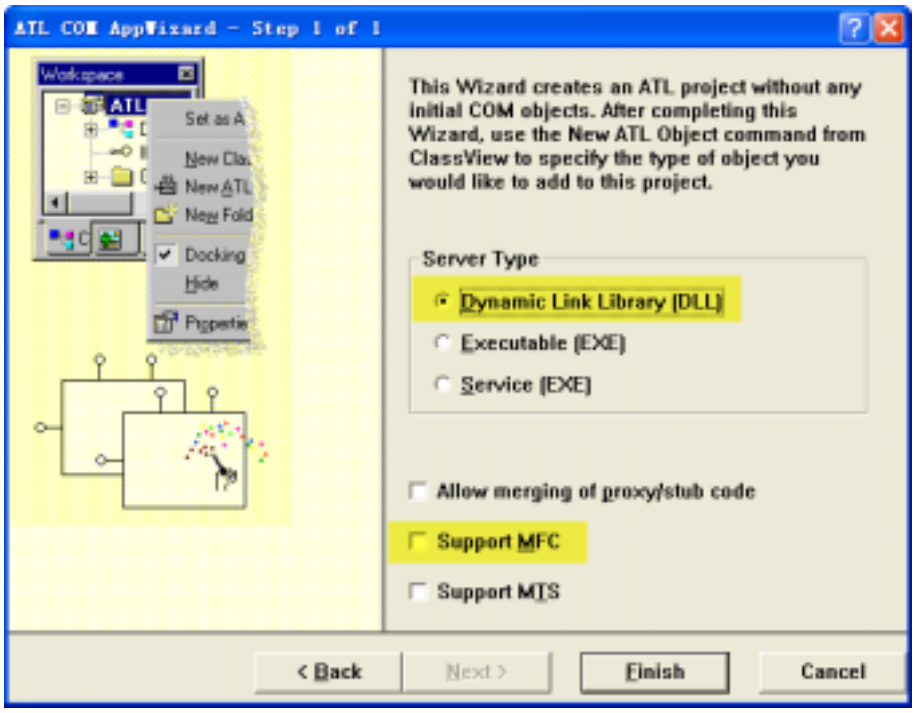
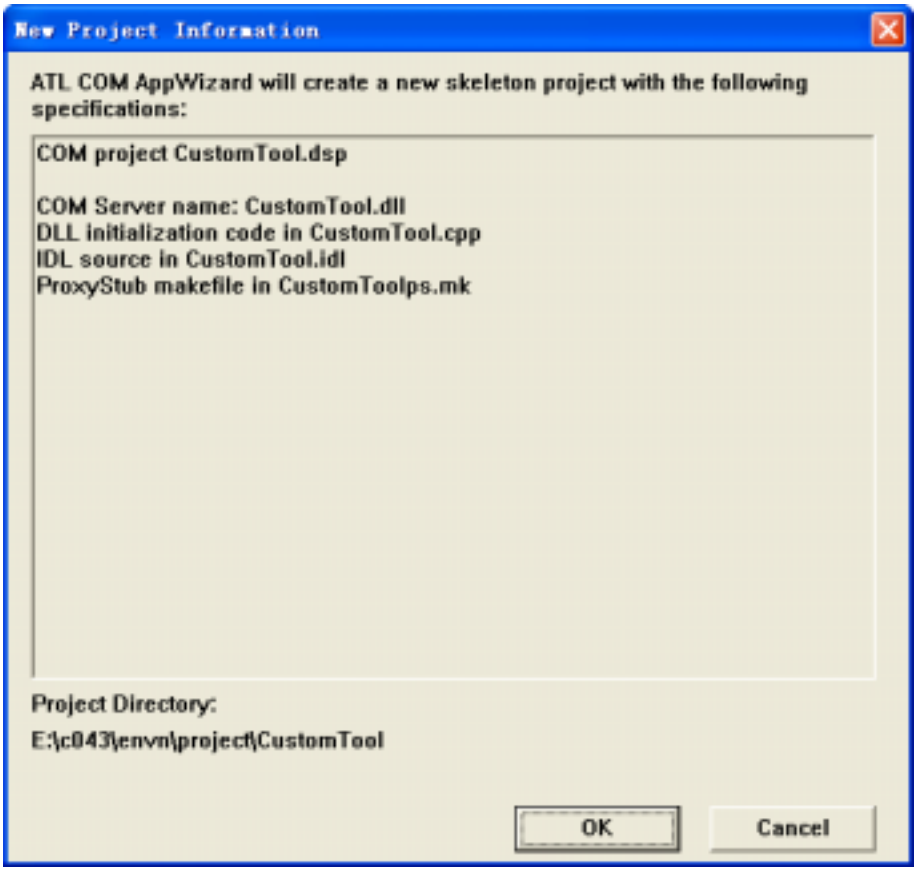
1 打开 vc6 ，file->new,弹出 new 对话框，选择 projects 面板，选择 ATL COM AppWizard。输入工程名 CustomTool。



2 点击 ok，选择默认设置即可。如果想在工程中使用 MFC,则选中 Support MFC 选项。



3 点击 Finish。查看工程信息。

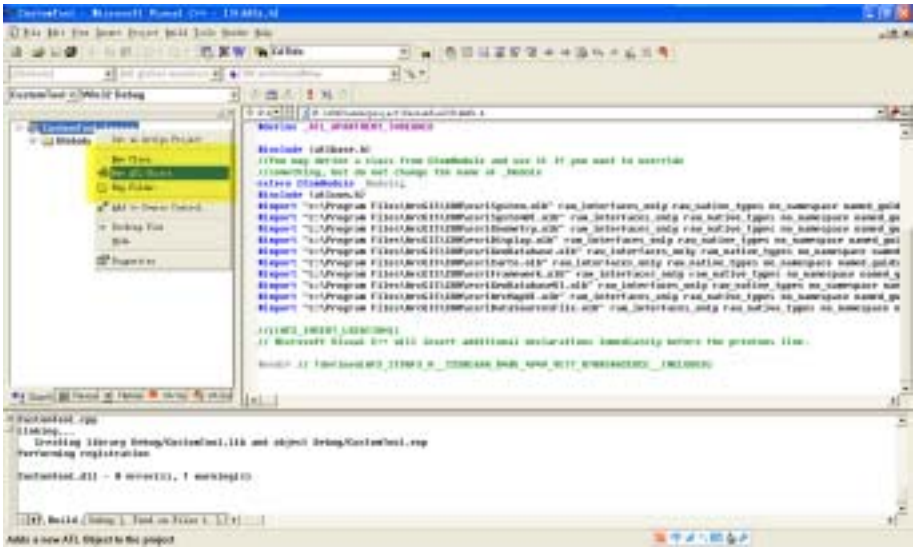


4 点击 ok。

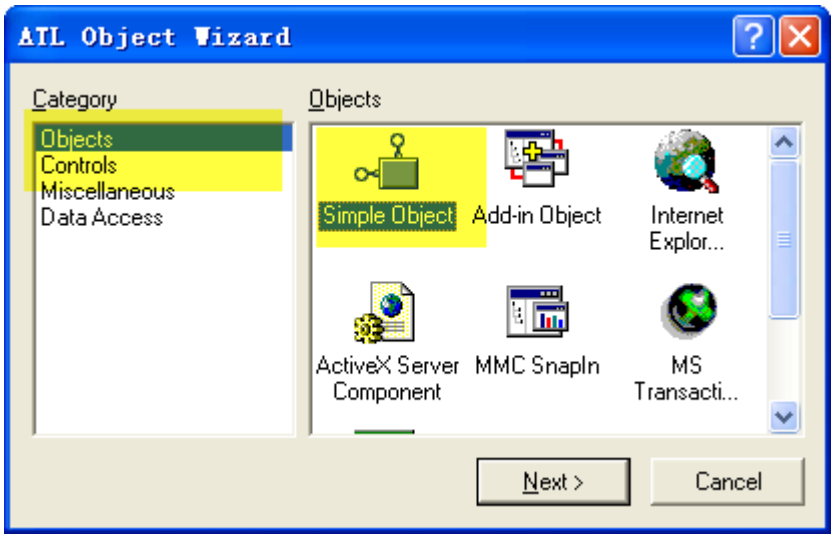
5 将下面代码拷贝到 Stdafx.h 文件中，放到 #include <atlcom.h>后面。这段代码的含义是引入 ao 的类型库，关于类型库的详细信息请参考 MSDN。

```
1.  #import  "c:\Program  Files\ArcGIS\COM\esriSystem.olb"  raw_interfaces_only
    raw_native_types no_namespace named_guids exclude("OLE_COLOR", "OLE_HANDLE")
2.  #import  "c:\Program  Files\ArcGIS\COM\esriSystemUI.olb"  raw_interfaces_only
    raw_native_types no_namespace named_guids exclude("OLE_COLOR", "OLE_HANDLE")
3.  #import  "c:\Program  Files\ArcGIS\COM\esriGeometry.olb"  raw_interfaces_only
    raw_native_types  no_namespace  named_guids  exclude("OLE_COLOR",  "OLE_HANDLE")
    rename("wkbPoint","esri_wkbPoint")     rename("wkbPolygon","esri_wkbPolygon")
    rename("wkbMultiPoint","esri_wkbMultiPoint")
    rename("wkbMultiPolygon","esri_wkbMultiPolygon")
    rename("wkbGeometryCollection","esri_wkbGeometryCollection")
    rename("wkbXDR","esri_wkbXDR") rename("wkbNDR","esri_wkbNDR")
4.  #import  "c:\Program  Files\ArcGIS\COM\esriDisplay.olb"  raw_interfaces_only
    raw_native_types no_namespace named_guids exclude("OLE_COLOR", "OLE_HANDLE")
5.  #import "c:\Program Files\ArcGIS\COM\esriGeoDatabase.olb" raw_interfaces_only
    raw_native_types no_namespace named_guids exclude("OLE_COLOR", "OLE_HANDLE")
6.  #import  "c:\Program  Files\ArcGIS\COM\esriCarto.olb"  raw_interfaces_only
    raw_native_types no_namespace named_guids exclude("OLE_COLOR", "OLE_HANDLE")
7.  #import  "c:\Program  Files\ArcGIS\COM\esriFramework.olb"  raw_interfaces_only
    raw_native_types no_namespace named_guids exclude("OLE_COLOR", "OLE_HANDLE")
8.  #import          "c:\Program          Files\ArcGIS\COM\esriGeoDatabaseUI.olb"
    raw_interfaces_only      raw_native_types      no_namespace      named_guids
    exclude("OLE_COLOR", "OLE_HANDLE")
9.  #import  "c:\Program  Files\ArcGIS\COM\esriArcMapUI.olb"  raw_interfaces_only
    raw_native_types no_namespace named_guids exclude("OLE_COLOR", "OLE_HANDLE")
10. #import         "c:\Program         Files\ArcGIS\COM\esriDataSourcesFile.olb"
    raw_interfaces_only      raw_native_types      no_namespace      named_guids
    exclude("OLE_COLOR", "OLE_HANDLE")
```

6 切换到 class View，选中 CustomTool 工程，右键。选择 new ATL Object。



7 弹出 new ATL Object wizard。选择 simple Object。



8 单击 next，在 name 面板输入 name：CustomToolbar

9 切换到 Attribute 面板，Threading Model 选择 Single，Interface 选择 Custom，Aggregation 选择 no。并勾选上 Support ISupportErrorInfo。

10 点击确定。

11 切换到 FileView，双击 CustomTool.idl，打开 CustomTool.idl 文件，在

importlib("stdole32.tlb");

importlib("stdole2.tlb");

后面加入下面代码：

```
1.   importlib("c:\Program Files\ArcGIS\COM\esriSystemUI.olb");
2.   importlib("c:\Program Files\ArcGIS\COM\esriFramework.olb");
```

在 [default] interface ICustomToolbar;

下面加入下面代码：

interface IToolbarDef;

使 CustomToolbar 支持 IToolbarDef 接口。

12 双击 CustomToolbar.h 文件，打开 CustomToolbar.h 文件。使 CCustomToolbar 类继承 IToolBarDef 接口，即在

public ICustomToolbar 后面添加如下代码：

,public IToolBarDef 记得要用逗号分隔开。

在宏 BEGIN_COM_MAP(CCustomToolbar)和 END_COM_MAP()中间添加以下代码：

COM_INTERFACE_ENTRY(IToolBarDef)

将下面函数添加为类的成员函数，保证为 public 的：

```
1.       // IToolBarDef
2.   STDMETHOD(get_ItemCount)(LONG* numItems);
```

```
3.  STDMETHOD(GetItemInfo)(LONG pos, IItemDef* itemDef);
4.  STDMETHOD(get_Name)(BSTR* Name);
5.  STDMETHOD(get_Caption)(BSTR* Name);
```

上面的代码是 IToolBarDef 的接口函数。要在 CustomToolbar 中实现。

13 双击 CustomToolbar.cpp, 打开 CustomToolbar.cpp 文件，将下面代码拷贝到 CustomToolbar.cpp 文件中。

其中 get_ItemCount 函数为得到当前工具条工具的个数，GetItemInfo 得到工具条中第 pos 个工具的信息，

其中 CustomTool.MyTool 为我们将要实现工具的 ProgID。

```
1.  // IToolBarDef
2.  STDMETHODIMP CCustomToolbar::get_ItemCount(LONG* numItems)
3.  {
4.  if (0 == numItems)
5.    return E_POINTER;
6.
7.  // Set how many commands will be on the toolbar
8.  *numItems = 1;
9.
10. return S_OK;
11. }
12. STDMETHODIMP CCustomToolbar::GetItemInfo(LONG pos, IItemDef* itemDef)
13. {
14. if (0 == itemDef)
15.   return E_POINTER;
16.
17. // Define the commands that will be on the toolbar. The 1st command
18. // will be the custom command MyCustomTool. The 2nd and 3rd commands will
19. // be the builtin AddData commands and ZoomIn tool.
20. // ID is the ProgID of the command. Group determines whether the command
21. // begins a new group on the toolbar
```

```
22.
23.  HRESULT hr;
24.  switch (pos)
25.  {
26.      case 0:
27.    hr = itemDef->put_ID(CComBSTR(L"CustomTool.MyTool"));
28.    if (FAILED(hr)) return hr;
29.
30.    hr = itemDef->put_Group(VARIANT_FALSE);
31.    if (FAILED(hr)) return hr;
32.    break;
33.      default:
34.    return E_INVALIDARG;
35.  }
36.
37.  return S_OK;
38.  }
39.  STDMETHODIMP CCustomToolbar::get_Name(BSTR* Name)
40.  {
41.  if (0 == Name)
42.    return E_POINTER;
43.
44.  // Set the internal name of the toolbar.
45.  *Name = ::SysAllocString(L"CustomTool");
46.
47.  return S_OK;
48.  }
49.  STDMETHODIMP CCustomToolbar::get_Caption(BSTR* Name)
50.  {
51.  if (0 == Name)
52.    return E_POINTER;
```

```
53.
54.  // Set the string that appears as the toolbar's title
55.  *Name = ::SysAllocString(L"CustomTool");
56.
57.  return S_OK;
58.  }
```

14 使用上面的方法再创建一个 ATL Object，选项同 CustomToolbar。命名为 MyTool。

15 重新打开 customTool.idl，在[default] interface IMyTool;后面加上如下代码：

interface ICommand;

interface ITool;

和 CustomToolbar 支持 IToolbarDef 接口类似，给 CMyTool 类添加 interface ICommand;interface ITool;的支持。

步骤同上，首先 CMyTool 继承 ICommand，ITool。

在在宏 BEGIN_COM_MAP(CMyTool)和 END_COM_MAP()中间添加对 ICommand，ITool 的支持：

COM_INTERFACE_ENTRY(ICommand)

COM_INTERFACE_ENTRY(ITool)

定义 ICommand，ITool 的接口函数：

将下列代码加到 CMyTool 类中作为 public 的成员函数。

```
1.     STDMETHOD(get_Enabled)(VARIANT_BOOL* Enabled);
2.   STDMETHOD(get_Checked)(VARIANT_BOOL* Checked);
3.   STDMETHOD(get_Name)(BSTR* Name);
4.   STDMETHOD(get_Caption)(BSTR* Caption);
5.   STDMETHOD(get_Tooltip)(BSTR* Tooltip);
6.   STDMETHOD(get_Message)(BSTR* Message);
7.   STDMETHOD(get_HelpFile)(BSTR* HelpFile);
8.   STDMETHOD(get_HelpContextID)(LONG* helpID);
9.   STDMETHOD(get_Bitmap)(OLE_HANDLE* Bitmap);
10.  STDMETHOD(get_Category)(BSTR* categoryName);
11.  STDMETHOD(OnCreate)(IDispatch* hook);
12.  STDMETHOD(OnClick)();
13.  // ITool
```

```
14.  STDMETHOD(get_Cursor)(OLE_HANDLE* Cursor);
15.  STDMETHOD(OnMouseDown)(LONG button, LONG shift, LONG x, LONG y);
16.  STDMETHOD(OnMouseMove)(LONG button, LONG shift, LONG x, LONG y);
17.  STDMETHOD(OnMouseUp)(LONG button, LONG shift, LONG x, LONG y);
18.  STDMETHOD(OnDblClick)();
19.  STDMETHOD(OnKeyDown)(LONG keyCode, LONG shift);
20.  STDMETHOD(OnKeyUp)(LONG keyCode, LONG shift);
21.  STDMETHOD(OnContextMenu)(LONG x, LONG y, VARIANT_BOOL* handled);
22.  STDMETHOD(Refresh)(OLE_HANDLE hdc);
23.  STDMETHOD(Deactivate)(VARIANT_BOOL* complete);
```

将下列代码加到 CMyTool 类中作为 private 变量。

```
1.   HBITMAP m_hBitmap;
2.   HCURSOR m_hCursor;
3.   IApplicationPtr m_ipApp;
4.   IDocumentPtr m_ipDoc;
```

修改 CShowXY 的构造函数：

将

```
CMyTool()
{
}
```

替换成：

```
  CMyTool();
~CMyTool();
```

在 MyTool.cpp 文件中实现上面的函数，拷贝下面代码到 MyTool.cpp 中。

```
1.   // CMyTool
2.   CMyTool::CMyTool()
3.   {
4.     m_hBitmap = :oadBitmap(_Module.m_hInst, MAKEINTRESOURCE(IDB_BITMAP1));
5.   }
```

```
CMyTool::~CMyTool()
{
  :eleteObject(m_hBitmap);
}
// ICommand
STDMETHODIMP CMyTool::get_Enabled(VARIANT_BOOL* Enabled)
{
  if (0 == Enabled)
    return E_POINTER;
  // Add some logic here to specify when the command should
  // be enabled. In this example, the command is always enabled.
  *Enabled = VARIANT_TRUE;
  return S_OK;
}
STDMETHODIMP CMyTool::get_Checked(VARIANT_BOOL* Checked)
{
  if (0 == Checked)
    return E_POINTER;
  return E_NOTIMPL;
}
STDMETHODIMP CMyTool::get_Name(BSTR* Name)
{
  if (0 == Name)
    return E_POINTER;
  // Set the internal name of this command. By convention, this
  // name string contains the category and caption of the command.
  *Name = ::SysAllocString(L"DeveloperSamples_MyTool");
  return S_OK;
}
STDMETHODIMP CMyTool::get_Caption(BSTR* Caption)
{
```

```
37.    if (0 == Caption)
38.      return E_POINTER;
39.    // Set the string that appears when the command is used as a
40.    // menu item.
41.    *Caption = ::SysAllocString(L"MyTool");
42.    return S_OK;
43.  }
44.  STDMETHODIMP CMyTool::get_Tooltip(BSTR* Tooltip)
45.  {
46.    if (0 == Tooltip)
47.      return E_POINTER;
48.    // Set the string that appears in the screen tip.
49.    *Tooltip = ::SysAllocString(L"MyTool");
50.    return S_OK;
51.  }
52.  STDMETHODIMP CMyTool::get_Message(BSTR* Message)
53.  {
54.    if (0 == Message)
55.      return E_POINTER;
56.    // Set the message string that appears in the statusbar of the
57.    // application when the mouse passes over the command.
58.    *Message = ::SysAllocString(L"This is my custom tool");
59.    return S_OK;
60.  }
61.  STDMETHODIMP CMyTool::get_HelpFile(BSTR* HelpFile)
62.  {
63.    if (0 == HelpFile)
64.      return E_POINTER;
65.    return E_NOTIMPL;
66.  }
67.  STDMETHODIMP CMyTool::get_HelpContextID(LONG* helpID)
```

```
68.  {
69.    if (0 == helpID)
70.      return E_POINTER;
71.    return E_NOTIMPL;
72.  }
73.  STDMETHODIMP CMyTool::get_Bitmap(OLE_HANDLE* Bitmap)
74.  {
75.    if (0 == Bitmap)
76.      return E_POINTER;
77.    // Set the bitmap of the command. The m_hBitmap variable is set
78.    // in class constructor
79.    *Bitmap = (OLE_HANDLE)m_hBitmap;
80.    return S_OK;
81.  }
82.  STDMETHODIMP CMyTool::get_Category(BSTR* categoryName)
83.  {
84.    if (0 == categoryName)
85.      return E_POINTER;
86.    // Set the category of this command. This determines where the
87.    // command appears in the Commands panel of the Customize dialog.
88.    *categoryName = ::SysAllocString(L"Developer Samples");
89.    return S_OK;
90.  }
91.  STDMETHODIMP CMyTool::OnCreate(IDispatch* hook)
92.  {
93.    // The hook argument is a pointer to Application object.
94.    // Establish a hook to the application
95.    m_ipApp = hook;
96.    m_ipApp->get_Document(&m_ipDoc);
97.    return S_OK;
98.  }
```

```
99.  STDMETHODIMP CMyTool::OnClick()
100. {
101.   // Add some code to do some action when the command is clicked. In this
102.   // example, a message box is displayed.
103.   CComBSTR bstrCaption(L"MyTool Command");
104.   CComBSTR bstrMsg(L"Clicked on my command.");
105.   USES_CONVERSION;
106.   ::MessageBox(0, OLE2T(bstrMsg), OLE2T(bstrCaption), MB_OK);
107.   return S_OK;
108. }
109. // ITool
110. STDMETHODIMP CMyTool::get_Cursor(OLE_HANDLE* Cursor)
111. {
112.   if (0 == Cursor)
113.     return E_POINTER;
114.   // Set the cursor of the command. The m_pCursor variable is set
115.   // in Class_Initialize
116.   *Cursor = (OLE_HANDLE)m_hCursor;
117.   return S_OK;
118. }
119. STDMETHODIMP CMyTool::OnMouseDown(LONG button, LONG shift, LONG x, LONG y)
120. {
121.   // Add some code to do some action when the mouse button is pressed.
122.   // This example displays the X and Y coordinates of the
123.   // left mouse button click in the statusbar message in ArcMap.
124.   // Button, X, and Y are passed in as arguments to this sub procedure.
125.   // Check to see if left button is pressed
126.   if (1 == button)
127.   {
128.     IMxApplicationPtr ipMxApp;
129.     ipMxApp = m_ipApp;
```

```
130.     HRESULT hr;
131.     IAppDisplayPtr ipAppDisplay;
132.     ipMxApp->get_Display(&ipAppDisplay);
133.     // Convert x and y to map units. m_ipApp is set in OnCreate.
134.     IDisplayTransformationPtr ipDisplayTrans;
135.     ipAppDisplay->get_DisplayTransformation(&ipDisplayTrans);
136.     IPointPtr ipPoint;
137.     hr = ipDisplayTrans->ToMapPoint(x, y, &ipPoint);
138.     // Set the statusbar message.
139.     double dX, dY;
140.     TCHAR tX[16], tY[16];
141.
142.     ipPoint->get_X(&dX);
143.     ipPoint->get_Y(&dY);
144.     _sntprintf(tX, 16, _T("%5.3lf"), dX);
145.     _sntprintf(tY, 16, _T("%5.3lf"), dY);
146.     CComBSTR bstrMsg;
147.     bstrMsg =  tX;
148.     bstrMsg += L", ";
149.     bstrMsg += tY;
150.     IStatusBarPtr ipStatusBar;
151.     m_ipApp->get_StatusBar(&ipStatusBar);
152.     ipStatusBar->put_Message(0, bstrMsg);
153.   }
154.   return S_OK;
155. }
156. STDMETHODIMP CMyTool::OnMouseMove(LONG button, LONG shift, LONG x, LONG y)
157. {
158.   // Add some code to do some action when the mouse is moved.
159.   // This example changes the statusbar message.
160.   IStatusBarPtr ipStatusBar;
```

```
161.   m_ipApp->get_StatusBar(&ipStatusBar);
162.   ipStatusBar->put_Message(0, CComBSTR(L"ITool_OnMouseMove"));
163.   return S_OK;
164. }
165. STDMETHODIMP CMyTool::OnMouseUp(LONG button, LONG shift, LONG x, LONG y)
166. {
167.   return E_NOTIMPL;
168. }
169. STDMETHODIMP CMyTool::OnDblClick()
170. {
171.   // Add some code to do some action on double-click.
172.   // This example makes the builtin Select Graphics Tool the active tool.
173.
174.   ICommandBarsPtr ipCommandBars;
175.   m_ipDoc->get_CommandBars(&ipCommandBars);
176.   // The identifier for the Select Graphics Tool
177.   CComVariant vVariant("{C22579D1-BC17-11D0-8667-0000F8751720}");
178.   ICommandItemPtr ipSelectTool;
179.   ipCommandBars->Find(vVariant, VARIANT_FALSE, VARIANT_FALSE, &ipSelectTool);
180.   // Set the current tool of the application to be the Select Graphics Tool
181.   m_ipApp->putref_CurrentTool(ipSelectTool);
182.   return S_OK;
183. }
184. STDMETHODIMP CMyTool::OnKeyDown(LONG keyCode, LONG shift)
185. {
186.   // Add some code to do some action when a keyboard button is pressed.
187.   // This example changes the statusbar message.
188.   IStatusBarPtr ipStatusBar;
189.   m_ipApp->get_StatusBar(&ipStatusBar);
190.   ipStatusBar->put_Message(0, CComBSTR(L"ITool_OnKeyDown"));
191.   return S_OK;
```

```
192. }
193. STDMETHODIMP CMyTool::OnKeyUp(LONG keyCode, LONG shift)
194. {
195.   // Add some code to do some action when a keyboard button is released.
196.   // This example changes the statusbar message.
197.   IStatusBarPtr ipStatusBar;
198.   m_ipApp->get_StatusBar(&ipStatusBar);
199.   ipStatusBar->put_Message(0, CComBSTR(L"ITool_OnKeyUp"));
200.   return S_OK;
201. }
202. STDMETHODIMP CMyTool::OnContextMenu(LONG x, LONG y, VARIANT_BOOL* handled)
203. {
204.   if (0 == handled)
205.     return E_POINTER;
206.   // Add some code to show a custom context menu when there is a right click.
207.   // This example creates a new context menu with one macro item
208.   ICommandBarsPtr ipCmdBars;
209.   m_ipDoc->get_CommandBars(&ipCmdBars);
210.   // Create a new context menu
211.   ICommandBarPtr ipShortCut;
212.   ipCmdBars->Create(CComBSTR(L"MyShortCut"),      esriCmdBarTypeShortcutMenu,
    &ipShortCut);
213.   // Add an item to it
214.   ICommandItemPtr ipItem;
215.   CComVariant vFaceID(4);
216.   USHORT uAction(0);
217.   CComVariant vIndex(0);
218.   ipShortCut->CreateMacroItem(CComBSTR(L"MyMacro"),    &vFaceID,    &uAction,
    &vIndex, &ipItem);
219.   // Display the menu
220.   ICommandItemPtr ipChoice;
```

```
221.   ipShortCut->Popup(0, 0, &ipChoice);
222.   // Let the application know that you handled the OnContextMenu event.
223.   // If you don't do this, the standard context menu will be displayed after
224.   // this custom context menu.
225.   *handled = VARIANT_TRUE;
226.   return S_OK;
227. }
228. STDMETHODIMP CMyTool::Refresh(OLE_HANDLE hdc)
229. {
230.   return S_OK;
231. }
232. STDMETHODIMP CMyTool:eactivate(VARIANT_BOOL* complete)
233. {
234.   if (0 == complete)
235.     return E_POINTER;
236.   // Deactivate the tool. If set to False (the default), you cannot interact
237.   // with any other tools because this tool cannot be interrupted by another
238.   // tool.
239.   *complete = VARIANT_TRUE;
240.   return S_OK;
241. }
```

从 hook 得到 m_ipApp，从 m_ipApp 得到 m_ipDoc。

得到 m_ipDoc 以后就可以对地图文档进行操作了。

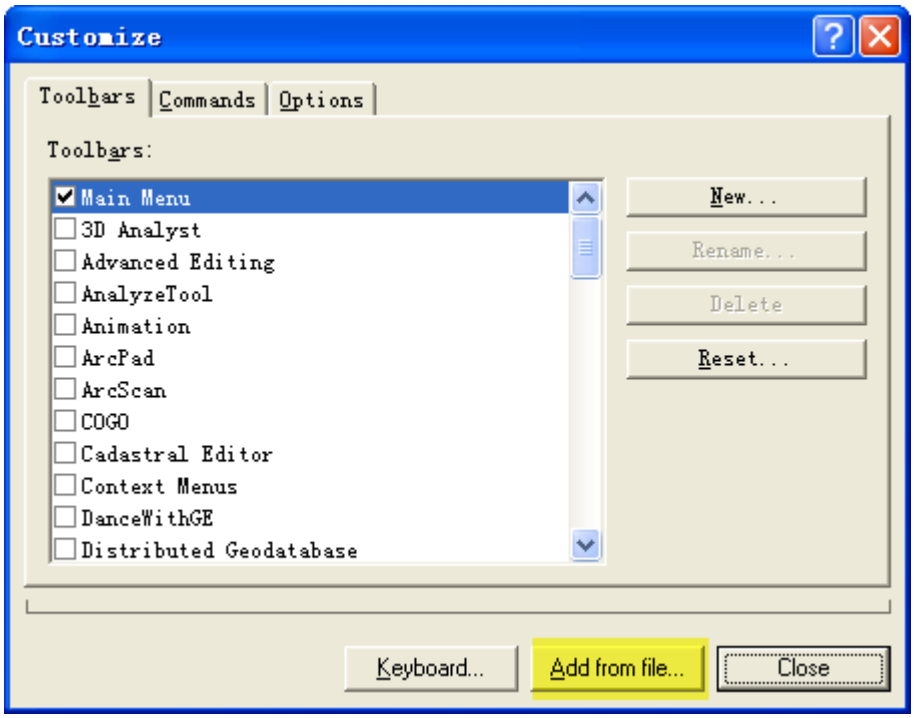
其他函数都比较好理解，主要是对鼠标事件的响应已经一些状态信息的获取。

注意 ：要导入一个 bitmap 的资源文件做为工具图标，默认 ID 为 IDB_BITMAP1。

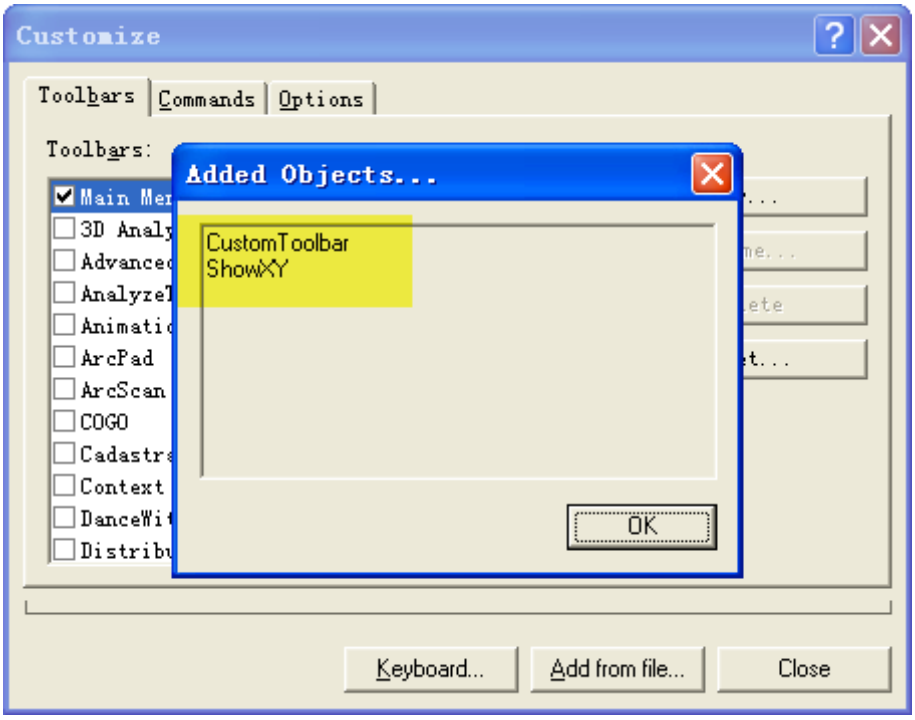
16 编译工程。

17 打开 ArcMap 右键在工具栏空白处单击，选择 customize…。

18 选择 add from file…

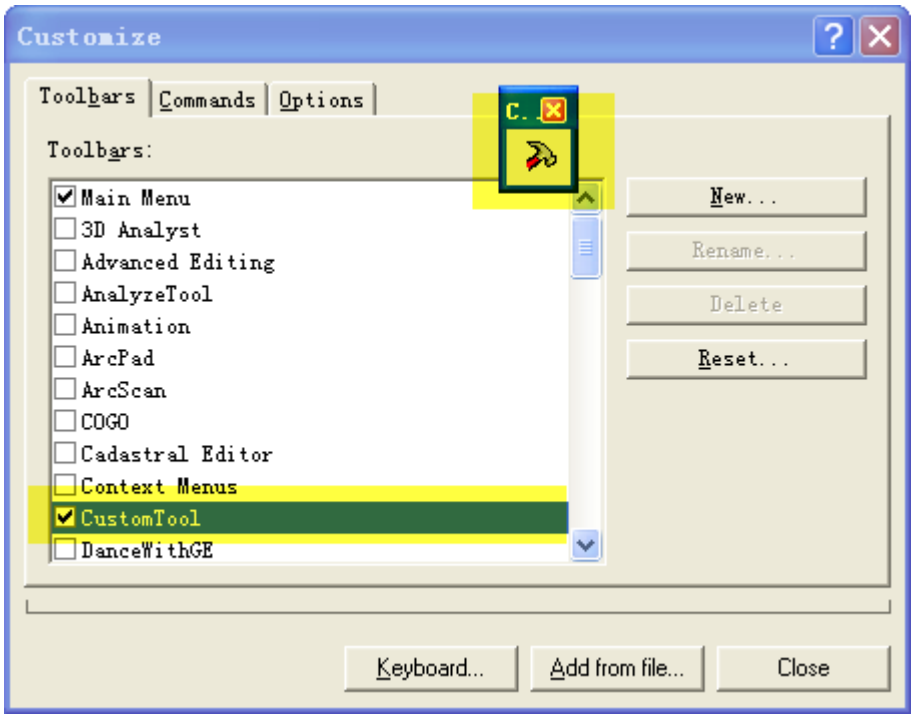


19 定位到 debug 目录，选择 CustomTool.dll



20 点击打开

21 点击 ok，选择 CustomTool



22 点击 close。