



FAA
Aeronautical Information Management
AJV-2

FAA - AIXM 5 Viewer – User Manual

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User Manual



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1. Introduction

The AIXM 5 Viewer is an application developed by Luciad for the Federal Aviation Administration (FAA). The goal of the application is to be the standard viewer to visualize AIXM 5.0 and AIXM 5.1 data.

The Aeronautical Information Exchange Model (AIXM) is an XML-based aeronautical data format developed jointly by FAA and Eurocontrol. It is designed to enable the management and distribution of Aeronautical Information Services (AIS) data in digital format. The format contains support for a wide variety of aeronautical data, such as airports, airspaces, routes, navaids, and procedures. It also supports both static and dynamic data, the latter being also referred to as a Digital NOTAM. Detailed information about the AIXM format and the various specifications can be obtained from <http://www.aixm.aero>.

Section 2 describes how to install and start the application. In Section 3 the User Interface is explained and the function of its components is summarized briefly. Section 4 contains detailed information on how to load AIXM 5 data and work with it in the AIXM Viewer.

1.1. About the AIXM 5 Viewer

The AIXM 5 Viewer provides 2D and 3D visualization of AIXM 5.0 and AIXM 5.1 data. After loading any compliant AIXM 5 document users can see the data mapped onto a virtual earth, customize the visualization, navigate through the wide set of properties of AIXM 5 features, compare multiple features, and play back the state of data at concrete time positions according to AIXM 5's extensive temporality model. Additionally the application supports the visualization of image data in the GeoTIFF format and vector data in the SHP format. Combined with an intuitive, easy-to-learn User Interface and a web-based one-click installation process, the AIXM 5 Viewer allows users to efficiently view and manage aeronautical information.

1.2. About this guide

The purpose of this guide is to get the reader familiar with the functionality that the AIXM 5 Viewer offers. This guide is written for any end user of the AIXM 5 Viewer and although it does not require any specific knowledge to read it, the assumption is that the reader has a common understanding of the ATC/ATM domain.



1.2.1 Conventions

This section describes the typographical conventions and terminology for mouse actions that are used in this guide.

a. Typographical conventions

- **Bold** text is used for names of GUI elements such as buttons, menu items and options, icons, and tools. Note that when the name is used multiple times in a paragraph, only the first occurrence of the name is bold.
- The | sign is used for submenus as for example in **File | Open**.
- `Typewriter` text is used for file names.

b. Terminology for mouse actions

The following terminology is used for the different mouse actions:

- **Click:** click once with the left mouse button.
- **Right-click:** click once with the right mouse button.
- **Double-click:** click twice (quickly) with the left mouse button.
- **Drag:** press the left mouse button while moving the mouse.



2. Getting Started

This chapter provides the download /installation instructions for the AIXM 5 Viewer and explains how to start the application. Additionally this chapter introduces the elements of the user interface. Read this chapter if you are new to the AIXM 5 Viewer and want to get familiar with the basic concepts and terminology.

2.1. System requirements

The AIXM 5 Viewer supports 32-bit and 64-bit versions of Windows, Linux and Mac OS X. The AIXM 5 Viewer requires the Java Runtime Environment version 1.6 or later, which is downloaded during the installation process if needed.

Minimum system specifications:

CPU: 1.6GHz

RAM: 1GB

Graphics card: OpenGL 1.1 compatible graphics card

Recommended system specifications:

CPU: Dual core 2GHz

RAM: 2GB

Graphics card: NVidia GeForce 8000 (or higher), GTX 200/400 and Quadro FX series.

2.2. Installing and starting the AIXM 5 Viewer

The AIXM 5 Viewer is delivered as a Java Web Start application. This means that you can start the AIXM 5 Viewer by opening your favorite web browser with the following page and clicking the **Launch** button:

<http://www.aixm.aero/AIXM5Viewer>



You will be prompted to open or save the `AIXM5Viewer.jnlp`. By saving the file in a convenient location on your computer, you can start the AIXM 5 Viewer by double-clicking the file instead of surfing to the internet address given above.

The AIXM 5 Viewer requires the Java Runtime Environment 1.6 or later. The installation process detects if the required Java version is available on your computer and downloads it if this is not the case. On the first start-up of the AIXM 5 Viewer, all necessary files will be downloaded. Starting the application again will not require additional downloads.

To be able to start the AIXM 5 Viewer, the Java cache must be enabled. The cache is active by default.

To activate the cache on Windows:

- Go to **Start > Control Panel** > Double click on the **Java** icon. The Java Control Panel will start.
- Click on the **General** tab
- Click on the **Settings** button from the **Temporary Internet Files** section
- Activate **Keep temporary files on my computer**.

To activate the cache on Mac OS X:

- Launch **Java Preferences** application from `/Applications/Utilities/Java`
- Click on the Network tab
- Activate **Keep temporary files for fast access**

To activate the cache on Linux:

- Go to the installation folder of the Java JRE
- Go to subfolder `bin`
- Start **ControlPanel**
- Click on the **General** tab
- Click on the **Settings** button from the **Temporary Internet Files** section
- Activate **Keep temporary files on my computer**.



During the start-up of the application, a window appears showing which components are being loaded (Initializing...). When the AIXM 5 Viewer is started, the interface looks as shown in Figure 1.

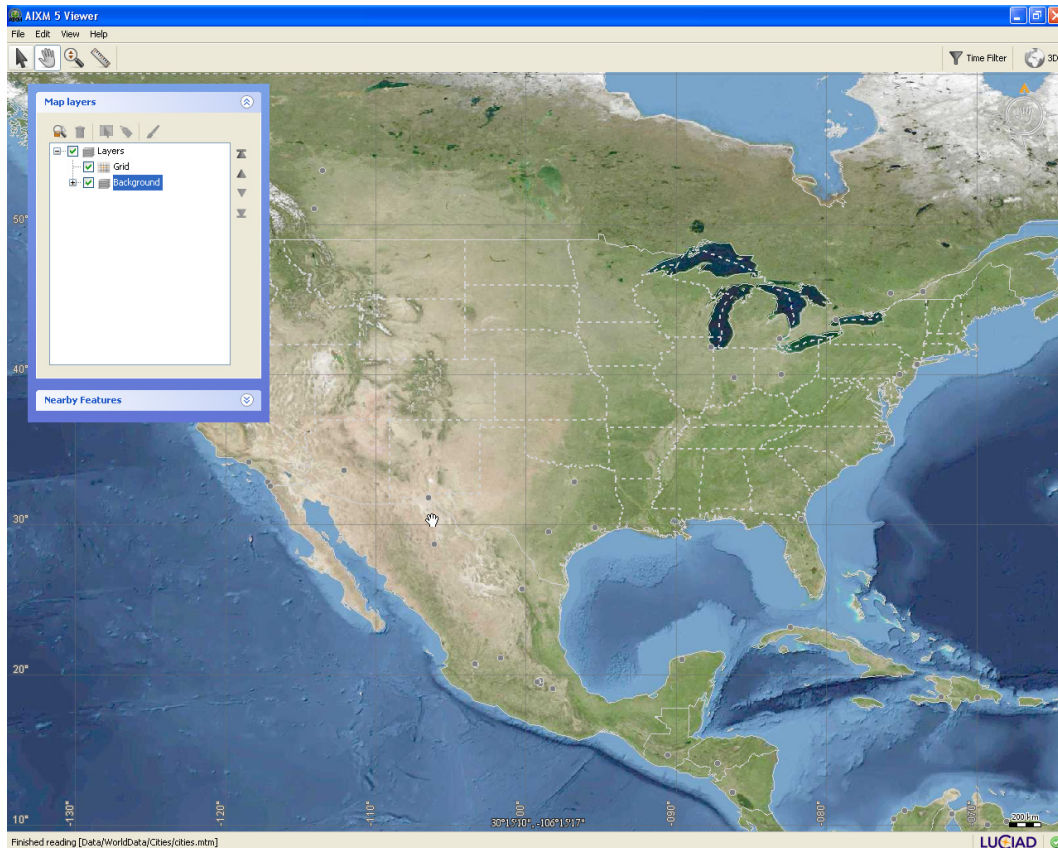


Figure 1 - The AIXM 5 Viewer user interface after startup

2.3. Support

For support, please contact:

Deborah.Cowell@faa.gov



3. The User Interface

This chapter describes the elements of the AIXM 5 Viewer's user interface. The viewer is started in an application window containing the following elements as shown in Figure 2:

- The title bar
- The menu bar
- The Map panel
- The Map layers panel
- The status bar

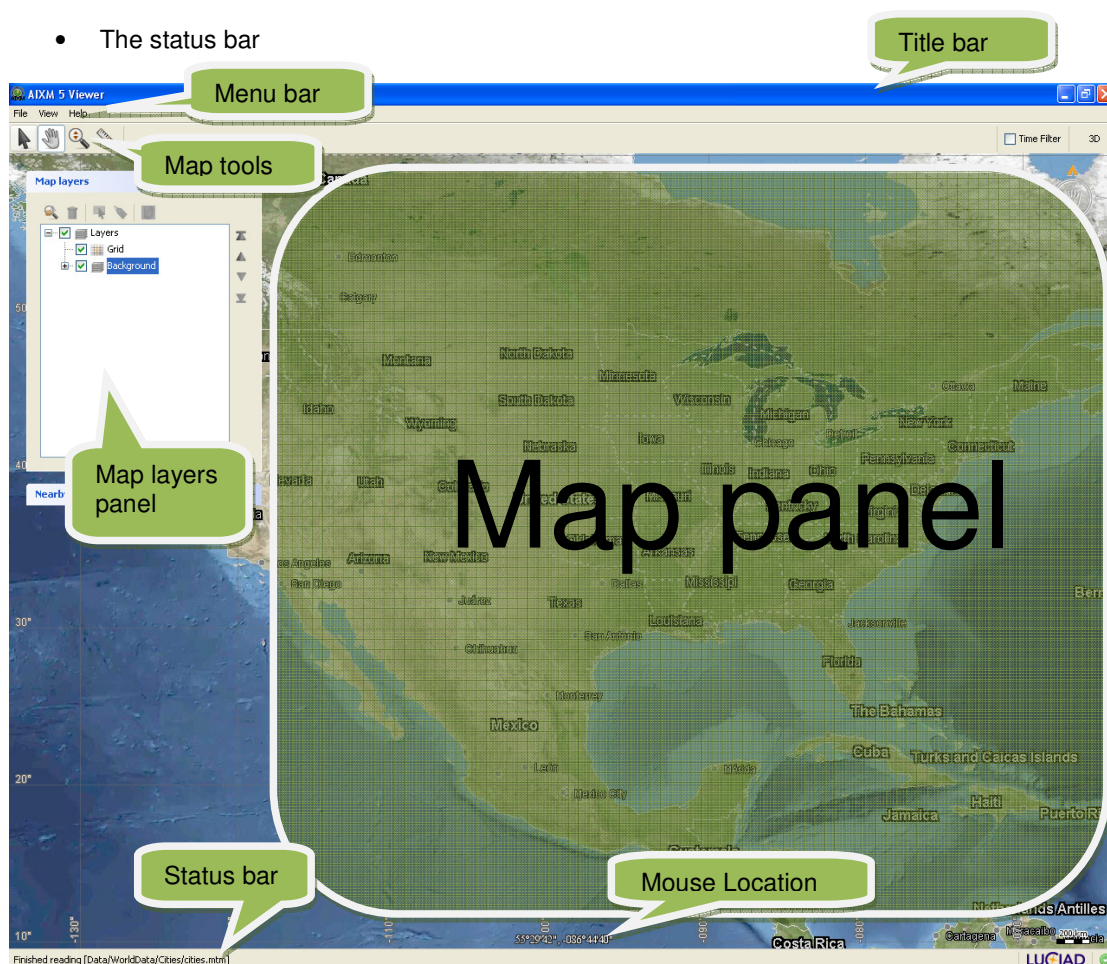


Figure 2 - User interface components



The title bar and status bar provide details on the application status. With the icons in the top right corner of the title bar you can minimize, maximize (or restore), and close the application window.

The menu bar contains the menus **File**, **View**, and **Help**. The last sections of this chapter describe the tasks that you can perform with these menus.

The first sections below provide a short description of the different panels that appear in the default user interface.

3.1. The Map panel

The Map panel is the main panel in the AIXM 5 Viewer application window and displays the loaded data in 2D or 3D. Figure 2 shows the Map panel when displaying 2D data. The next section describes the 2D Map panel and section 3.1.2 the 3D Map panel.

3.1.1 The 2D Map panel

The basic elements of the 2D Map panel are:

- The toolbar containing the map tools, as described in more detail below, as well as the time filter and 3D toggle buttons. The time filter functionality is described in Section 4.7. Clicking the 3D button replaces the 2D Map panel with the 3D Map panel.
- The map panel. This panel displays the map data in 2D.

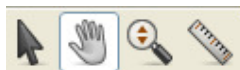


Figure 3 - The 2D map tools

The map tools as shown in Figure 3 allow you to interact with the map. Activate a map tool by selecting a tool from the map toolbar. Note that only one tool can be active at a time and that the Pan tool is activated by default.

The following 2D map tools are available:



The **Select** tool allows you to select one or more objects on the map in order to perform an action on them. The end of this section provides more information on selecting objects. When the select tool is active you can also use the middle mouse button for zooming (move the scroll wheel) and panning (press the middle mouse button and move the mouse).



The **Pan** tool allows you to move the map around in the map view. Click on a location on the map to pan to that location. Keeping the left mouse button pressed allows you to move the map around. You can also use the scroll wheel of the mouse to zoom in or out.



The **Zoom** tool allows you to zoom in or out on the map. To zoom in, position the mouse on the map and move the mouse up while pressing the left mouse button. To zoom out, move the mouse down while pressing the left mouse button. You can also scroll the mouse wheel to zoom in or out, irrespective of the tool that is active.

You can also use the navigation controls for panning or zooming as described in Section 3.1.3.



The **Ruler** tool allows you to create a path on the map and measure distances of that path. When activating the Ruler tool, a Ruler panel appears which allows you to change settings of the measurement mode and to view the measurements of the path. Section 4.9 describes the Ruler tool in more detail.

Selecting objects

When the select tool is active you can:

- select an individual object on the map by clicking on the object
- select multiple objects on the map by Shift-clicking on the objects or by dragging a rectangle around the object(s)
- add the selected object(s) to the comparison view by right-clicking on the object(s) and selecting “Compare” in the pop-up menu
- select an object from overlapping objects by Alt-clicking on the overlapping objects and selecting one of the objects from the menu
- deselect one object by Shift-clicking on the object
- deselect all objects by clicking on a location on the map outside the selected objects

3.1.2 The 3D Map panel

The 3D Map panel visualizes data in 3D. Figure 4 displays the 3D Map panel. It can be enabled by clicking the 3D button in the toolbar of the 2D Map panel as shown in Figure 5. To switch back to the 2D Map panel click on the icon again.



Figure 4 - 3D map user interface components

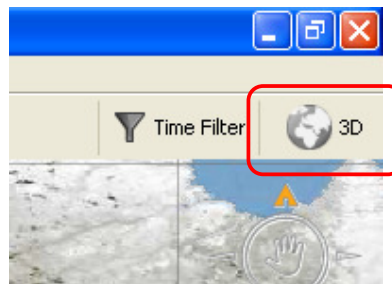



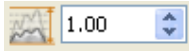


Figure 5 - The 3D toggle button

The  **Select** tool, the  **Pan** tool, and the  **Ruler** tool work the same as in 2D. However, they are extended to allow a rotation of the view by holding down the right mouse



button and moving the mouse. The **Zoom** tool is not available on the 3D Map. To zoom in or out scroll the mouse wheel or the navigation controls as described in Section 3.1.3.

With the  **Altitude Exaggeration** box you can determine the scale for enlarging altitudes in the 3D map. The default value is 1.00 meaning that altitudes are not enlarged. To exaggerate altitudes in the map, select a value using the upwards arrow next to the text box. The scale values increment with factor 0.5.

3.1.3 The Map navigation controls

Use the navigation controls on the 2D or 3D map, as shown in Figure 6, by moving the mouse over the controls to:

- **Move the map:** to determine the direction click on the compass border surrounding the hand icon and keep the left mouse button pressed to move the map into the selected direction.
- **Rotate the map (only in 3D):** to determine the rotation direction click on the compass and drag the mouse to move the map into the rotation direction. To reset the map with the north up, click on the north arrow.
- **Zoom out of the map:** click on the plus icon, keep the left mouse button pressed for continuous zooming.
- **Zoom in on the map:** click on the minus icon, keep the left mouse button pressed for continuous zooming.

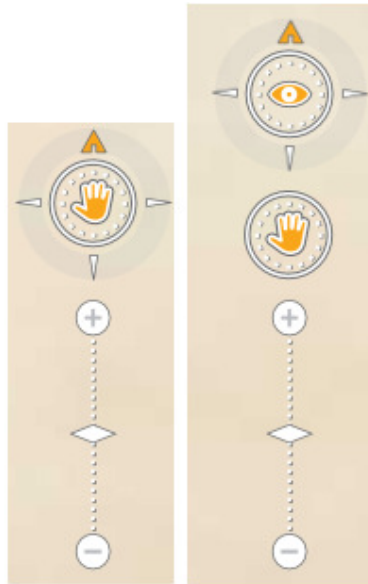


Figure 6 - 2D and 3D navigation controls

The navigation controls are shown by default on the map; to hide the controls deselect the **View | Navigation Controls** menu item.

3.1.4 The mouse location

The location of the current mouse position is by default displayed at the bottom of the map as shown in Figure 7. The mouse location is given in latitude DD°MM'SS" longitude DDD°MM'SS". To hide the mouse location, deselect the **View | Mouse Location** menu item.

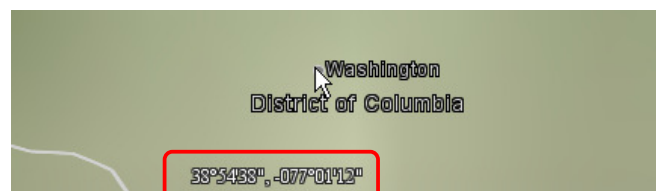



Figure 7 - Coordinates of mouse location

3.1.5 The status bar

In addition to a text message describing application events, the status bar contains the **Error Log** icon. The icon indicates if any error occurred during the runtime of the application and has the following meaning:

 No errors



❗ Errors encountered + number of errors

Click on the icon to obtain more information about the error and its cause. Figure 8 shows the error log after an invalid AIXM 5 file has been loaded.

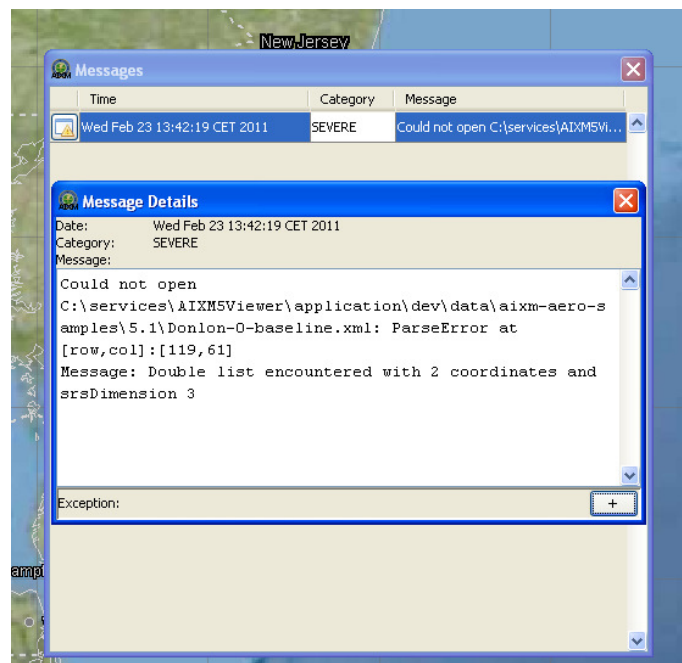


Figure 8 - Errors dialog box

3.2. The Map Layers panel

By default the Map Layers panel appears in the upper left corner of the 2D/3D Map panel and shows the layers visualized in the open map. The Map layers panel can be collapsed and expanded by clicking on the header of the panel. To hide the Map Layers panel, deselect the **View | Layers** menu item. Figure 9 shows the Map Layers panel. Section 4.2 provides detailed information on working with layers and using the Map Layers panel.

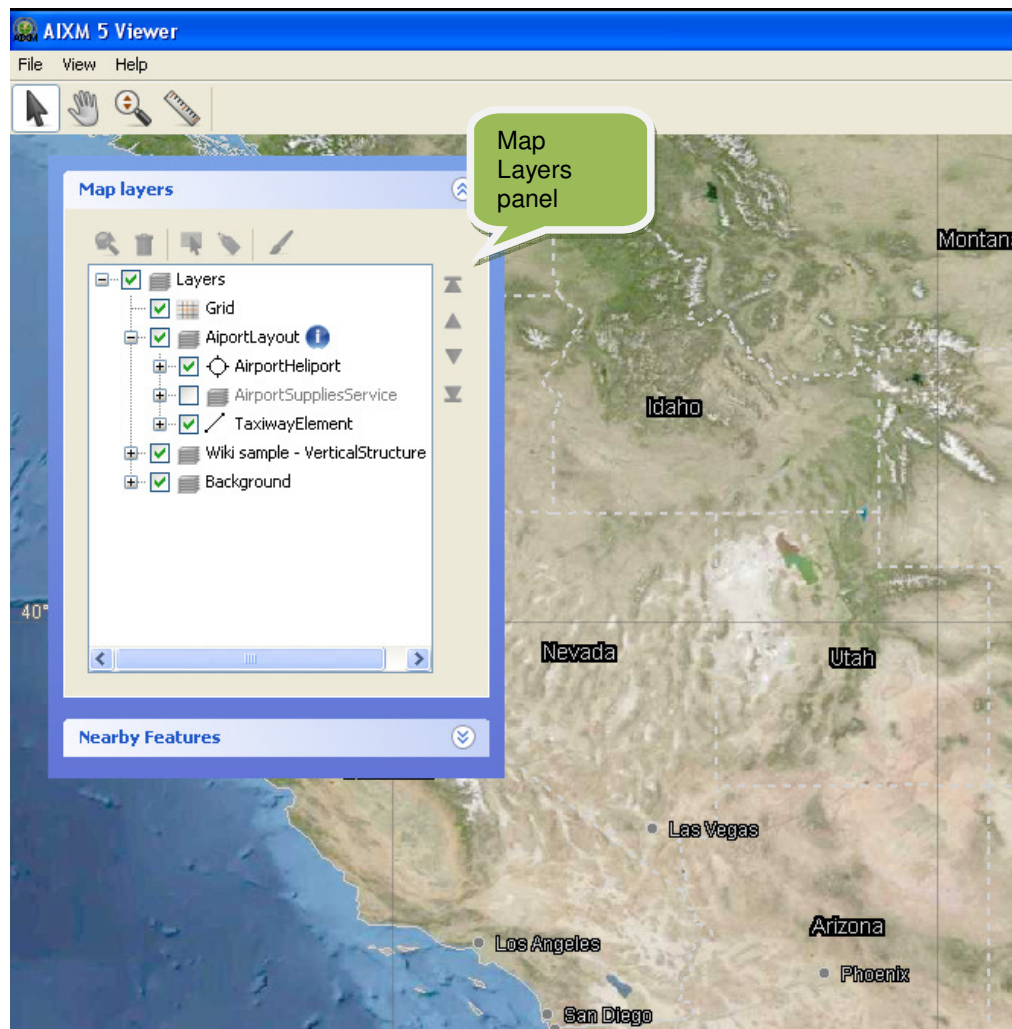


Figure 9 - The Map Layers panel displaying the loaded data and rendering order



4. Viewing AIXM 5 data

This chapter describes how to load and visualize AIXM 5 data. Additionally it provides all the necessary information for working with maps and layers.

4.1. Loading data

There are multiple ways to load data into the application:

- Select the **File | Open** menu item. A dialog box pops up allowing you to select the files from which to load data. Figure 10 shows the Windows dialog box for opening files. Keep the Ctrl-key pressed to select multiple files from the list with the left mouse button. A warning message appears when a file cannot be loaded.
- Drag and drop files from the file list of your operating system (for example from a Windows explorer window) directly onto the map or the Map Layers panel.
- Select a file from **File | Recent Files**.

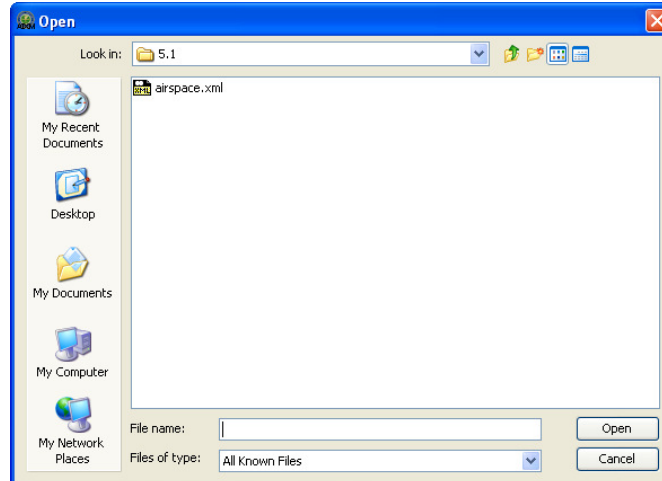


Figure 10 - The Windows dialog box to open files

When a file is loaded the map view is automatically fitted on the file's content. When loading multiple files at the same time the fit only happens on the last loaded file.




Table 1 shows the file formats and corresponding file extensions that the FAA AIXM 5 Viewer supports.

File type	File name/extension
AIXM 5.0	.xml
AIXM 5.1	.aixm51, .xml
GeoTIFF	.tif, .tiff
Shape	.shp, .shp.gz, .shp.zip

Table 1 - Supported file formats

If a .shp-data file is loaded with an unknown geographic reference system (that is without the associated .prj or .ref file), a dialog pops up in which you need to select or define the geographic reference system as described in Appendix A. Select the **Auto save** check box in the bottom left corner of the dialog box so that the defined geographic reference system is saved together with the data file. The reference file gets the same name as the data file and the extension .ref. When the data file is opened afterwards, the reference file is opened as well.

The loaded data files are added to the map and to the Map Layers panel. The AIXM 5 Viewer automatically fits the map on the content of the file. The busy icon  in front of a layer indicates that not all data for that layer has been loaded yet. You can continue with your operations as the data is loaded in the background. To customize the visualization and/or change the order in which the layers are rendered, use the Map Layers panel as described in the next section.

4.2. Working with layers

The map panel of the AIXM 5 Viewer interface visualizes one or more layers, each containing a set of geographic data. This section describes how to adjust the map visualization by changing properties of the layers and how to change the order in which the layers are being rendered onto the map.



4.2.1 The layer tree

Figure 11 shows the Map Layers panel. The layer tree in the Map Layers panel shows the separate layers of the map and has a similar function as the legend on a paper map. The check box next to the layer indicates if the layer is visible on the map or not. The icon next to the layer name shows the painting style that is used to represent the layer in the map view. Grouped layers have a plus icon next to them; click on the plus icon to expand the list and click on the minus icon to collapse an expanded list. Clicking the check box in front of grouped layers triggers a visibility change for all layers in that group.

When loading AIXM 5 data, every feature type present in the data is visualized in its own layer. All these layers are added to the layer tree as a layer group. The grouped layers entry has the name of the loaded file.

Besides providing an overview of the layers visualized in the map, the layer tree allows you to expand an AIXM 5 layer into a list of all features contained in that layer. When you select a feature in the list, the feature is also selected on the map. When right-clicking on a layer in the layer tree a menu pops up with all the described layer tools. Right-clicking an AIXM 5 feature in the layer tree a menu pops up with the following options:

- The **Compare** menu item adds the selected AIXM 5 feature(s) to the comparison view as described in Section 4.5.
- The **Center map** menu item centers the map on the selected AIXM 5 feature(s).
- The **Fit map** menu item fits the map view to the (union of the) selected AIXM 5 feature(s).

Some AIXM 5 feature types do not have a geometrical representation, for example runway directions. A layer visualizing such a feature type is displayed in grey in the layer tree and the check box in front of it cannot be activated, as shown in Figure 12.

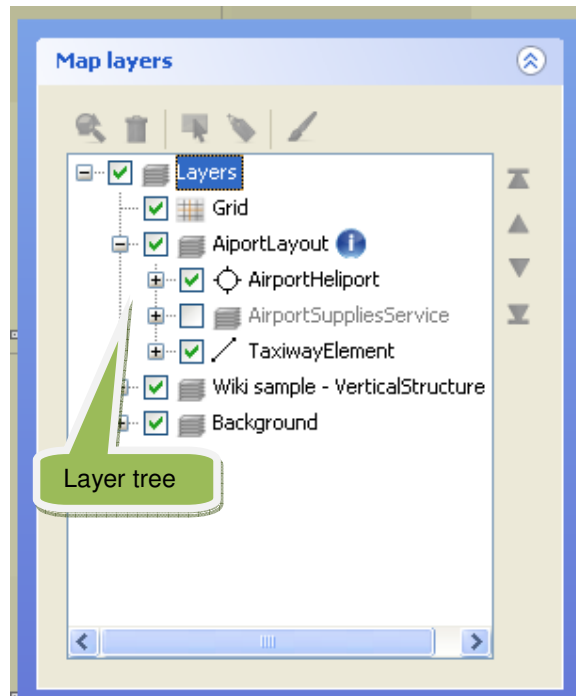


Figure 12 – The layer tree shows that the AirportSuppliesService features do not have a geometrical representation

The order of the layers in the tree reflects the order in which the layers are rendered in the map view. To change the order of the layers drag a layer up or down inside the layer tree. Alternatively use the following icons which are located next to the tree:

- The **Move layer(s) to top** icon moves the selected layer(s) to the top of the layers tree.
- The **Move layer(s) up** icon moves the selected layer(s) one level up in the layers tree.
- The **Move layer(s) down** icon moves the selected layer(s) one level down in the layers tree.
- The **Move layer(s) to bottom** icon moves the selected layer(s) to the bottom of the layers tree.

The next section describes the icons in the toolbar above the layer tree.

4.2.2 The layer tools

The toolbar in the Map Layers panel offers tools to perform actions with the map layers. You can only use these tools if one or more layers are selected. To select a layer, click on the layer





in the layer tree. To select multiple layers, keep the Ctrl-key pressed while clicking on the layers. The selected layers are highlighted as shown in Figure 13.

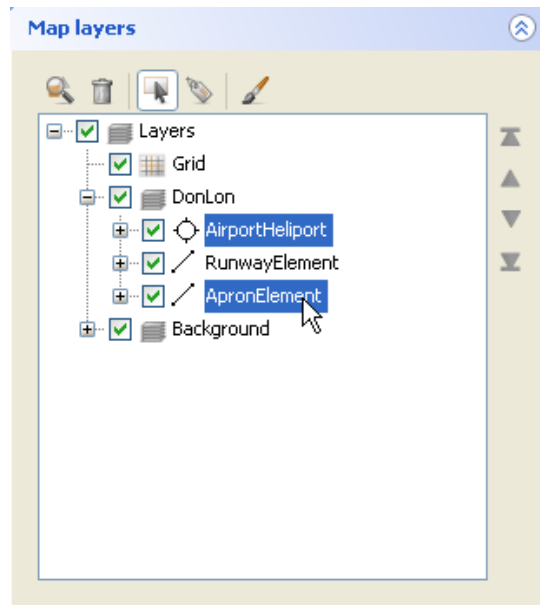




Figure 13 - Layer tree with multiple layers selected





The following layer tools are available:

 The **Fit map to content of layer** icon fits the map view to the (union of the) selected layer(s). This tool is only enabled if the selected layer(s) contain elements that have a geometrical representation.

 The **Remove layer from map** icon removes the selected layer(s) from the map.

 The **Allow or disallow selection of layer content** icon makes the selected layer(s) selectable which means that you can select objects from the layer(s) in the map view with the Select tool as described in Section **Error! Reference source not found.**

 The **Turn display of labels on or off** icon adds labels to the objects of the selected layer(s) in the map view. Note that the labels are decluttered to prevent them from overlapping each other.

 The **Change colors and line widths** icon shows a panel with styling options as described in Section 4.6.

4.3. Displaying AIXM 5 data properties

When selecting an AIXM 5 object on the 2D or 3D map using the **Select** tool described in Section **Error! Reference source not found.** or by clicking on an AIXM 5 feature in the layer tree, a balloon appears on the map as shown in Figure 14. The balloon displays a property-browser that allows navigating through the properties of the selected AIXM 5 feature. Each property is displayed in a separate page. Click a link, displayed as blue underlined text, to see additional information for a child property.

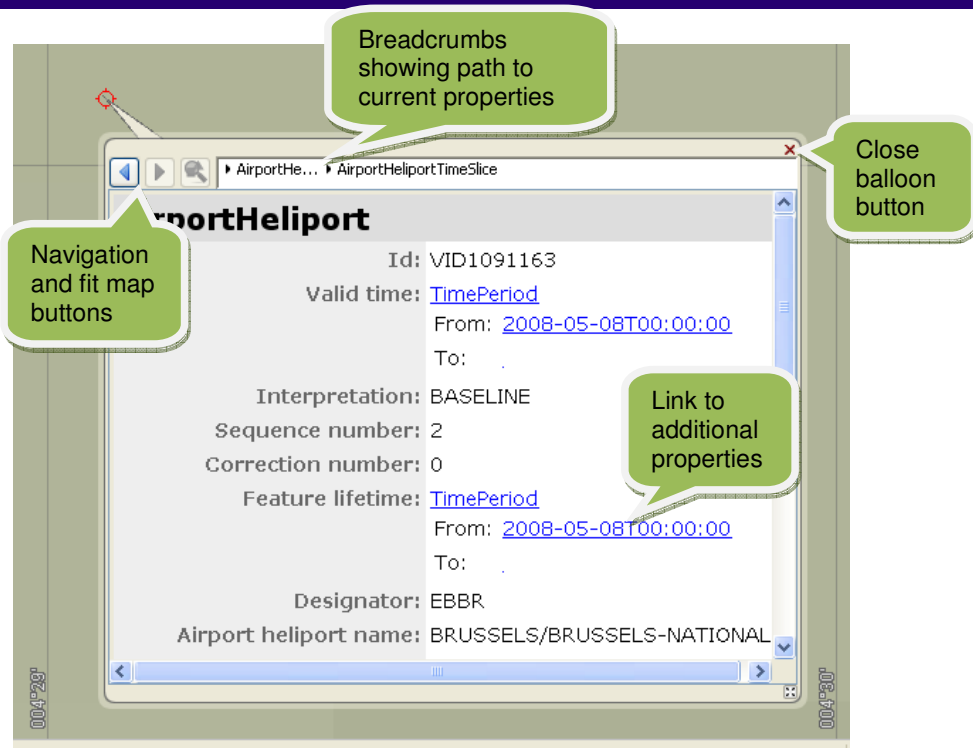


Figure 14 - The balloon for browsing through the properties of a selected feature

The top of the balloon panel contains the following icons:

- ▶ The **Go back one page** icon returns to the previously displayed property page.
- ▶ The **Go forward one page** icon goes forward one page in your browsing history.
- 🔍 The **Fit on displayed object** icon fits the map view to the AIXM 5 feature displayed in the balloon.
- ✖ The red cross in the upper right corner closes the balloon.

The **breadcrumbs** next to the balloon tools, as in ▶ RunwayDir... ▶ Runway ▶ AirportHeliport , display your current navigation path inside the properties of the displayed AIXM 5 feature. Click on a breadcrumb in the list to return to that property page.

4.4. Displaying Metadata

AIXM 5 supports metadata attachments on different levels. The metadata can be attached to a single feature or an entire AIXM 5 file. The latter is known as message-level metadata. When an AIXM 5 file contains message-level metadata, a blue info icon is displayed in the layer tree as shown in Figure 15. Click on the icon to display the metadata inside an on-map balloon.



Note that metadata attached to individual features is available in the balloon that pops up when the feature is selected as described in Section 4.3.

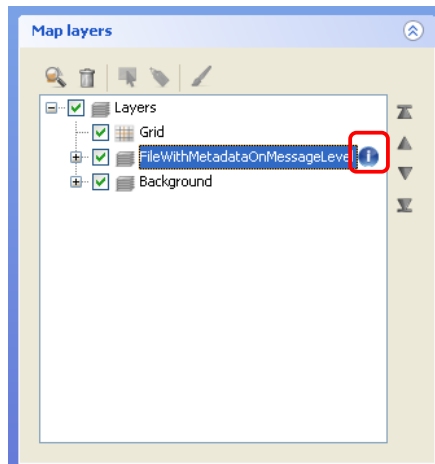


Figure 15 – The info icon in the layer tree for message-level metadata

4.5. Comparing AIXM 5 features

To compare multiple AIXM 5 features and their properties, the AIXM 5 Viewer supports a comparison view that shows several property-browsers, as described in Section 4.3, side by side. Figure 16 shows the comparison view with two property-browsers, each showing one feature, added to it.

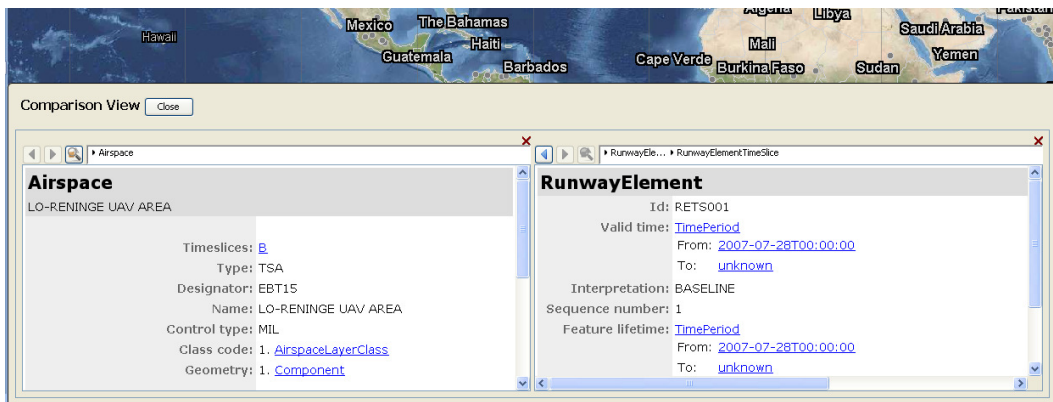


Figure 16 - Comparison view with two property-browsers containing one feature

You can add a property-browser for a certain feature to the comparison view in four ways:

- Activate the **Select** tool and double-click a feature on the map view.
- Activate the **Select** tool, right-click a feature on the map view and select **Compare** in the menu that pops up.



- Right-click a feature in the layer tree and select **Compare** in the menu that pops up.
- Right-click a feature in the table in the Nearby Features panel, as described in Section 4.8, and select **Compare** in the menu that pops up.

To remove a property-browser from the comparison view, click on the red cross in the right upper corner of the property-browser. You can close the entire comparison view by clicking the **Close** button. This also removes all added property-browsers from the comparison view.

4.6. Changing the style of AIXM 5 features

By default AIXM 5 features are visualized using ICAO symbology where applicable. To change the styling of an AIXM 5 layer select it in the layer tree and click on the **Style Options...** button in the toolbar of the Map layers panel. Alternatively you can trigger the styling dialog by right-clicking a layer in the layer tree and selecting **Style Options...** in the menu that pops up.

Figure 17 shows the layer customizer for an AirportHeliport layer.

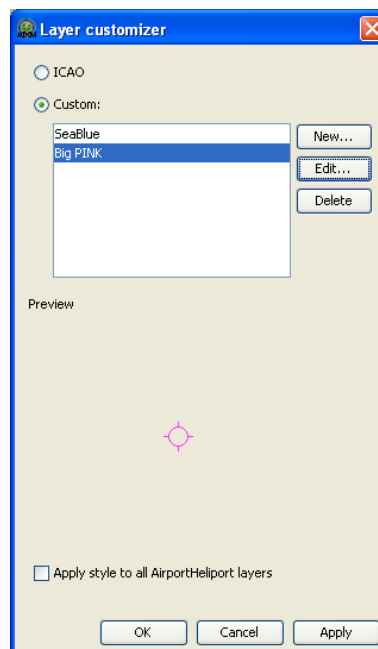


Figure 17 - Dialog box to customize AIXM 5 point features

The layer customizer allows choosing between the default ICAO style and a user-defined style. To create a custom style, select **New**.

You can edit styles by selecting **Edit...** Depending on the type of AIXM feature different customization properties are available. AIXM features are divided into three different styling-groups:



- Point features (such as airport-heliports, nav aids): customizable icon colors and icon sizes.
- Line features (such as guidance lines): customizable line color and line width.
- Area features (such as airspaces): customizable outline color, outline width, and fill color. Additionally the fill color can be enabled or disabled.

Note that line and area colors can be translucent, while point colors do not support translucency.

Some AIXM features belong to multiple groups, for example vertical structures, which can be a point, line, or area. For these features the layer customizer provides different tabs which allow the customization of each type as shown in Figure 18.

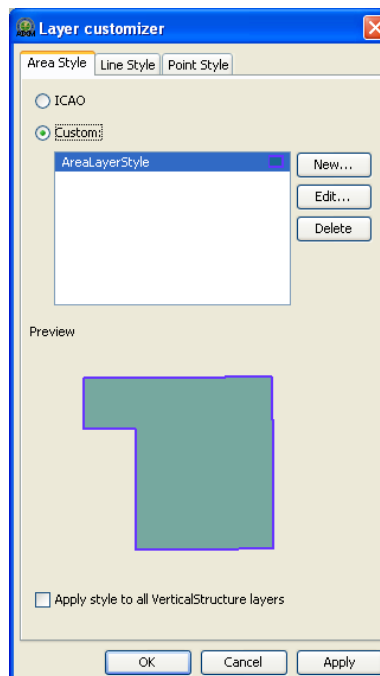


Figure 18 - Dialog box to customize styles of an AIXM 5 feature with multiple types of geometry

To delete a style, select it in the list and press **Delete**.

The created styles are stored on the harrdisk, allowing you to reuse them after restarting the application.



4.7. Working with the AIXM 5 temporality model

The AIXM 5 temporality model adds a time dimension to the aeronautical data to support state changes of an AIXM 5 feature over time. For detailed information see the AIXM 5 Temporality Concept¹.

By default the AIXM 5 Viewer displays the static **baseline** state of AIXM 5 data which is independent of time. To observe state changes of a feature over time, select the **Time Filter** checkbox in the Map panel's toolbar.

A transparent **Time Filter** panel appears that provides control over the application's current time. It consists of several tools including a **Time control** slider. The white vertical bars across the **Time Control slider** are **timeslice markers** that indicate the start/end-date of the valid time range of an AIXM feature. To see the exact time of a timeslice marker, hover the mouse over the slider and a tooltip appears displaying the date of that marker.

The dates below the slider on the right and left side display the start, respectively end time of the current time range. The date above the slider is the current simulation time. The display of timeslice markers and the current time range can be configured in the Previewer's options panel as described in Section 4.7.1.

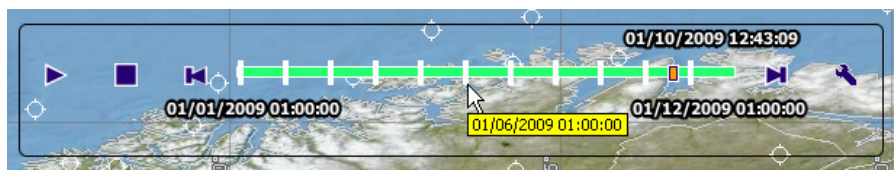


Figure 19 - The Time Filter panel with timeslice markers and tooltip

To control the currently visualized time the following icons are available:

- ▶/ || The **Play/Pause** icon activates/pauses the time simulation.
- The **Stop** icon stops the time simulation and sets the current time to the start time.
- ⏮ The **Go to previous timeslice marker** icon sets the current time to the closest previous timeslice marker.
- ⏭ The **Go to next timeslice marker** icon sets the current time to the closest next timeslice marker.
- ⚙ The **Options** icon triggers the display of a settings panel as shown in Figure 20 and provides options to customize the simulation as described in the next section.

¹ <http://www.aixm.aero/gallery/content/public/AIXM51/AIXM%20Temporality%201.0.pdf>



4.7.1 Time Filter options

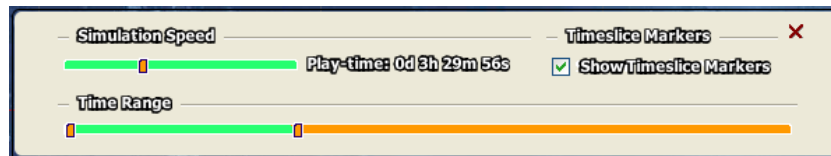


Figure 20 - The Time Filter options panel

The sliders in the **Time range** section control the playback time as shown in the **Time control** slider of the **Time Filter** panel. The full time range is the union of the time ranges of all loaded and visible AIXM files. Adjusting the time range allows you to focus on a smaller time frame. The slider in the **Simulation Speed** section controls the relative speed of the playback. The play-time next to the slider shows how long the simulation will run given the current simulation speed and time range.

Click on the **Show Timeslice Markers** checkbox to enable/disable the **timeslice markers** across the **Time control** slider. When the markers are disabled, the **Go to previous timeslice marker** and **Go to next timeslice marker** icons set the current time to the start time, respectively end time of the current time range.

4.8. Examining nearby features

The Nearby Features panel displays AIXM 5 features that are close to the last mouse click on the map. The panel appears top left of the map view. In Figure 21 the TaxiwayElements, RunwayElements, and the selected ApronElement itself are the AIXM features closest to the last mouse click on the map. By selecting one or more table row(s) in the Nearby Features panel, the corresponding AIXM feature(s) is/are selected.

Note that selecting a feature on the map through the layer tree as described in Section 4.2.1 does not update the Nearby Features panel.

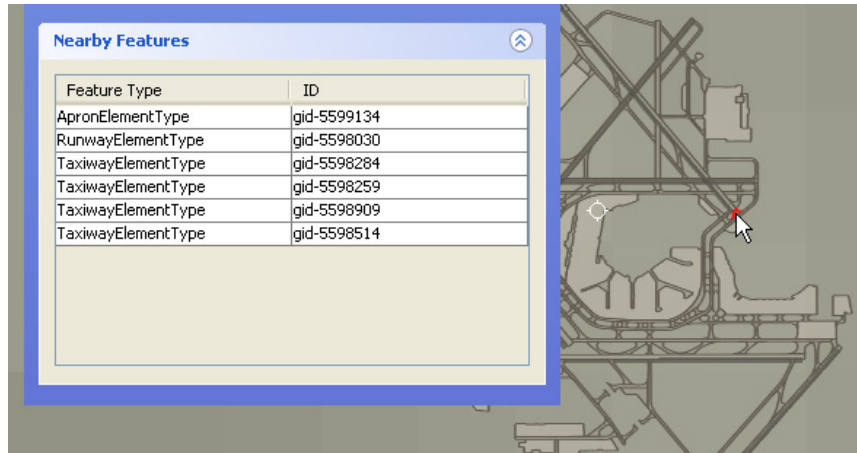


Figure 21 – The Nearby Features panel displaying features close to the selected feature on the map

4.9. Measuring distances on the map

The Ruler tool as described in Section **Error! Reference source not found.** and Section **Error! Reference source not found.** allows you to measure distances on the map. When the Ruler tool is active, you can draw a line with multiple segments (a polyline) on the map. Click on the map to indicate the start point of the polyline. Move the mouse and click on the map to add extra points to the polyline. To add the end point to the polyline, double-click or right-click on the map. Figure 22 shows the Ruler panel and a measurement of the distance from New York to Baltimore over Philadelphia on the 3D map.

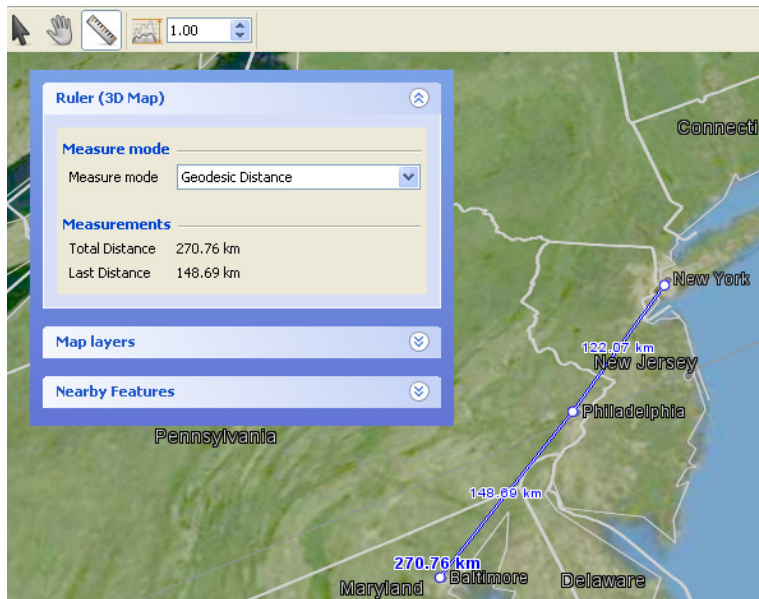


Figure 22 - The Ruler panel and a geodesic distance measurement in 3D

When the Ruler tool is active, the Ruler panel is displayed top left of the map view. The panel shows the measurement mode settings and the actual measurements of the last created path. Select one of the following measurement modes from the drop-down list:

- **Geodesic Distance**, also known as the distance of a great circle or orthodrome, measured on the ellipsoid
- **Rhumbline Distance**, also known as the distance of a loxodrome, measured on the ellipsoid
- **Projection Plane Distance**, the Cartesian distance in the projected coordinate system of the map

The measurements section shows:

- **Total Distance**: the total distance of the path
- **Last Distance**: the distance between the last two points of the path
- **Last Azimuth (only in 2D)**: the azimuth from the second last point to the last point of the path



Appendix A - Specifying the georeference system

To be able to load and correctly visualize .shp files with an unknown georeference system you need to choose or define a georeference system in the dialog box that appears when you are trying to load such a file. Inside the Choose geo reference dialog box you can select one of the following georeference systems:

- Geodetic reference: to represent geographic locations on an ellipsoidal (or a spherical) surface. Geodetic reference systems usually use an ellipsoid to approximate the shape of the earth.
- Grid reference: to represent geographic locations on a flat surface. A grid reference system is based on a geodetic reference system and uses a map projection for converting the curved surface of the earth to the flat surface of the map.

Figure 23 and Figure 24 show the specific settings for the different reference systems.

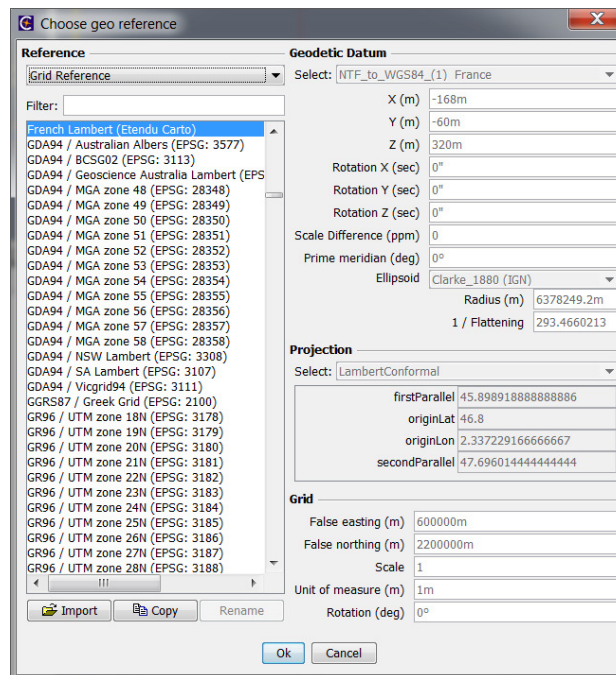


Figure 23 - Dialog box to specify a Grid Reference

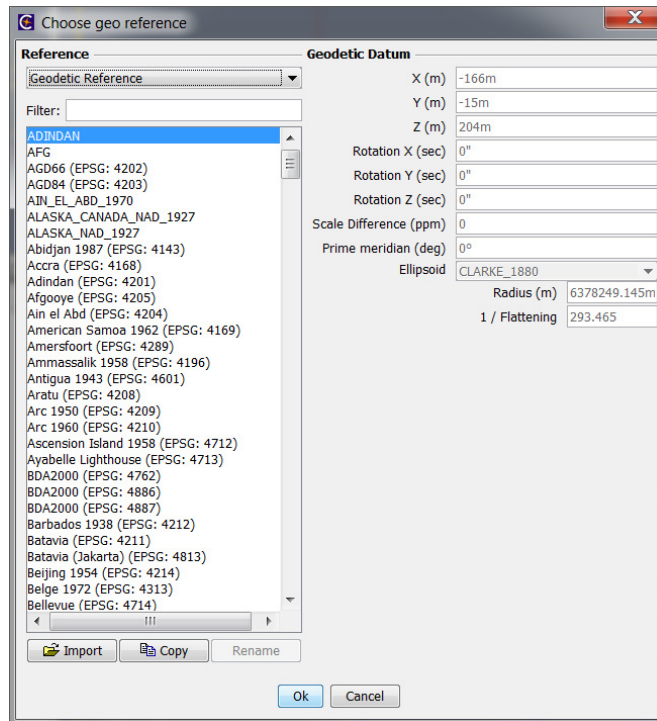


Figure 24 - Dialog box to specify a Geodetic Reference

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