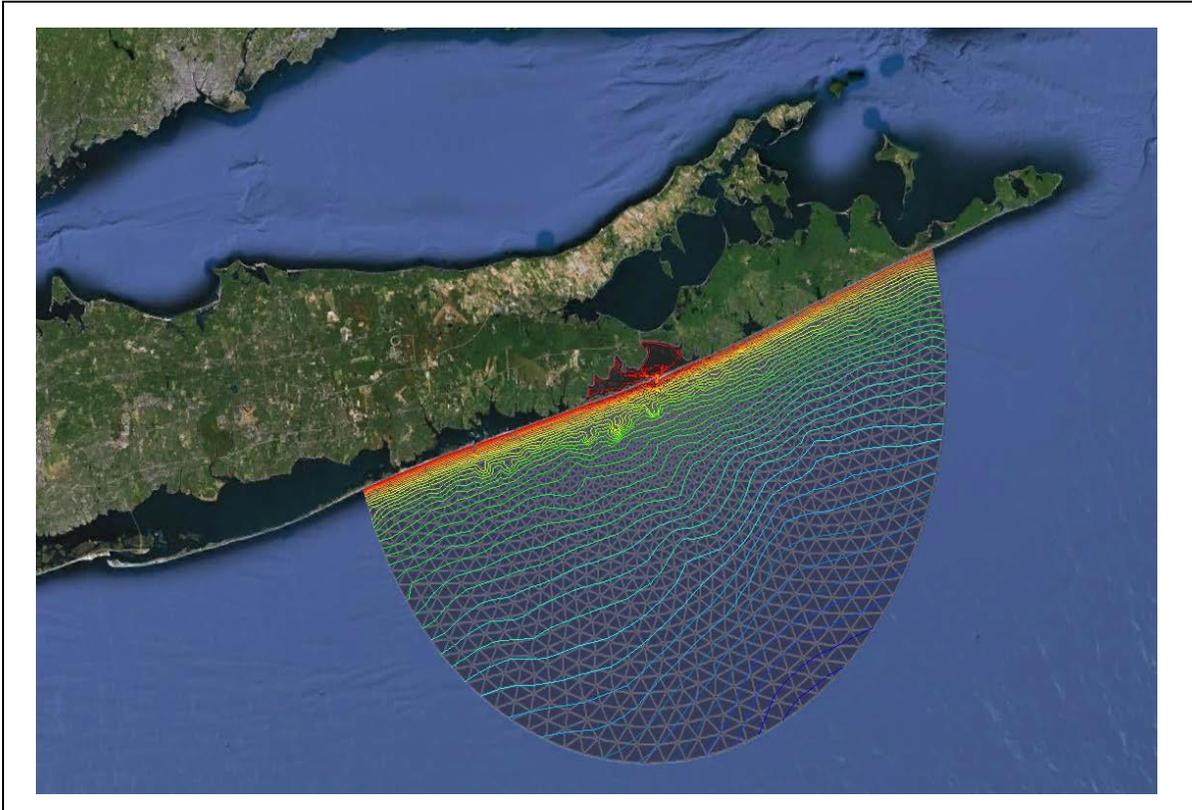


## SMS 13.0 Tutorial

### Google Earth® Files



#### Objectives

Learn how to save SMS data to a KMZ file format. KMZ files are Google Earth files and will allow viewing SMS data in Google Earth. SMS can save any georeferenced data into a KMZ format. This tutorial will go through the steps necessary to do this. This tutorial requires that Google Earth be installed and available.

#### Prerequisites

- None

#### Requirements

- Mesh Module
- Google Earth

#### Time

- 15–30 minutes

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## 1 Open an Existing Georeferenced File

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Any type of SMS data can be saved as a KMZ file if the data has been georeferenced and has a specific coordinate system. To make this tutorial easier, the example project will be working with previously georeferenced data. The “Overview” tutorial provides more detailed information about georeferencing.

To open the project in SMS, do the following:

1. Select *File* | **New** to make sure all other data has been erased.
2. Select *File* | **Open...** to bring up the *Open* dialog.
3. Browse to the *data files\* folder for this tutorial and select “shinfinal.sms”.
4. Click **Open** to import the project and exit the *Open* dialog.

## 2 Editing Display Options

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The first KMZ file will be of the mesh of Shinnecock Bay. Whatever options are turned on in SMS will be shown in Google Earth® when loading in the KMZ file.

1. Select *Display* | **Display Options...** to open the *Display Options* dialog.
2. Select “2D Mesh” from the list on the left side.
3. On the *2D Mesh* tab, turn off *Nodestrings*, *Mesh Boundary*, and *Contours*.

Turning off *Nodestrings* turns off the ocean and land boundary nodestrings specified on the mesh.

4. Click **OK** to close the *Display Options* dialog.
5. **Frame**  the project to center the mesh on the screen.
6. Turn off “ Map Data” in the Project Explorer.

The display should be showing a plain mesh (Figure 1).

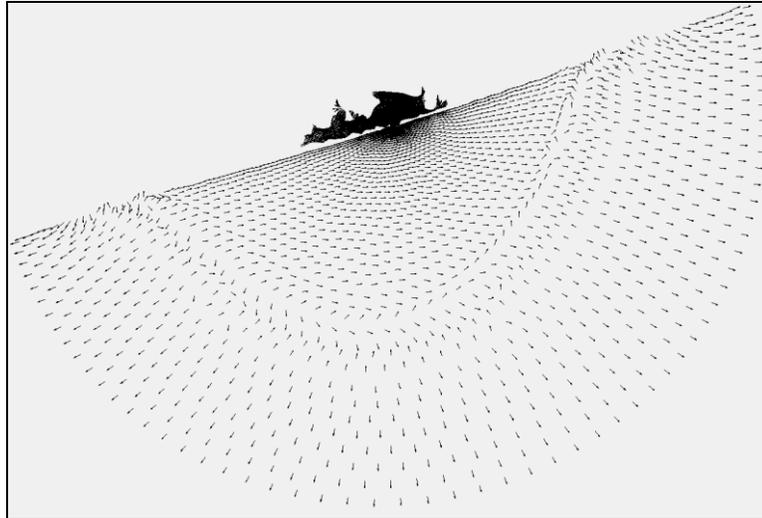


Figure 1 Plain mesh

### 3 Editing Projection

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In order to save data as a Google Earth KMZ file, the file has to be in global projection or the file will not be saved.

1. Select *Display* | **Display Projection...** to bring up the *Display Projection* dialog.
2. In the *Horizontal* section, select *Global projection* to bring up the *Horizontal Projection* dialog. If it does not appear automatically, click **Set Projection...** to bring up the dialog.
3. In the data tree, select “NAD 1927” under *Geographic Coordinate Systems / North America* .
4. Click **OK** to close the *Horizontal Projection* dialog.
5. In the *Vertical* section, select “Meters” from the *Units* drop-down.
6. Click **OK** to close the *Display Projection* dialog and complete the conversion.

### 4 Saving a KMZ File

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There are two different ways to save a Google Earth KMZ file: as a raster or as a vector file. The following sections will show the differences between the two methods. Make sure that the dataset to be saved out to a KMZ file is selected before saving.

#### 4.1 Raster KMZ file

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To save a raster KMZ file, do the following:

1. Select *File* | **Save As...** to bring up the *Save As* dialog.
2. Select “Google Earth Raster KMZ File (\*.kmz)” from the *Save as type* drop-down.
3. Enter “Raster.kmz” as the *File name* and click **Save** to export the raster KMZ file and close the *Save As* dialog.

The file should save fairly quickly in this case. KMZ file save time varies depending on the size of the original file from which the KMZ file is being exported.

4. If Google Earth is not already installed on the computer being used for this tutorial, download<sup>1</sup> and install it.
5. In Windows Explorer, go to the *data files*\ folder for this tutorial and double-click on “Raster.kmz” to open it into Google Earth.
6. When Google Earth opens, it should automatically zoom in to the desired location. If this does not happen, zoom in to Shinnecock Bay and the result should appear similar to Figure 2.

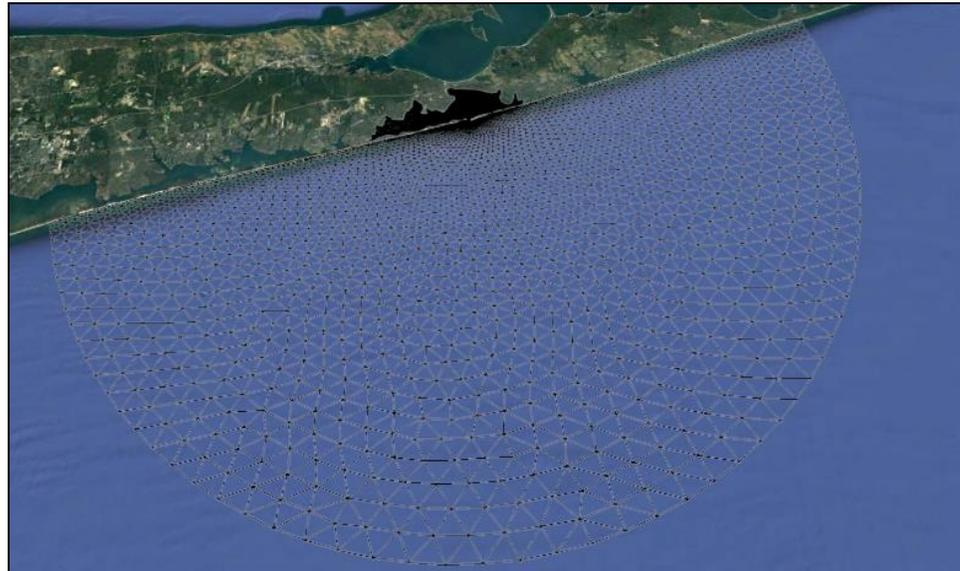


Figure 2 Raster file as shown in Google Earth

Some options in Google Earth may cause slight differences in how the KMZ file is displayed. These options can be turned on or off.

## 4.2 Vector KMZ file

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It is also possible to save a vector KMZ file in SMS. To do this:

1. Return to SMS.
2. Select *File* | **Save As...** to bring up the *Save As* dialog.

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<sup>1</sup> See <https://www.google.com/earth/download/ge/agree.html> for details on downloading Google Earth.

3. Select “Google Earth Vector KMZ File (\*.kmz)” from the *Save as type* dropdown.
4. Enter “Vector.kmz” as the *File name* and click **Save** to export the vector KMZ and close the *Save As* dialog.

Remember that KMZ file save time vary depending on the size of the original file from which the KMZ file is being exported.

5. In Windows Explorer, go to the *data files\* folder for this tutorial and double-click on “Vector.kmz” to open it into Google Earth.
6. Turn off “SMS – Raster” in Google Earth so only the “Vector.kmz” is showing.
7. When Google Earth opens, it should automatically zoom in to the desired location. If this does not happen, zoom in to Shinnecock Bay and the result should appear similar to Figure 3.

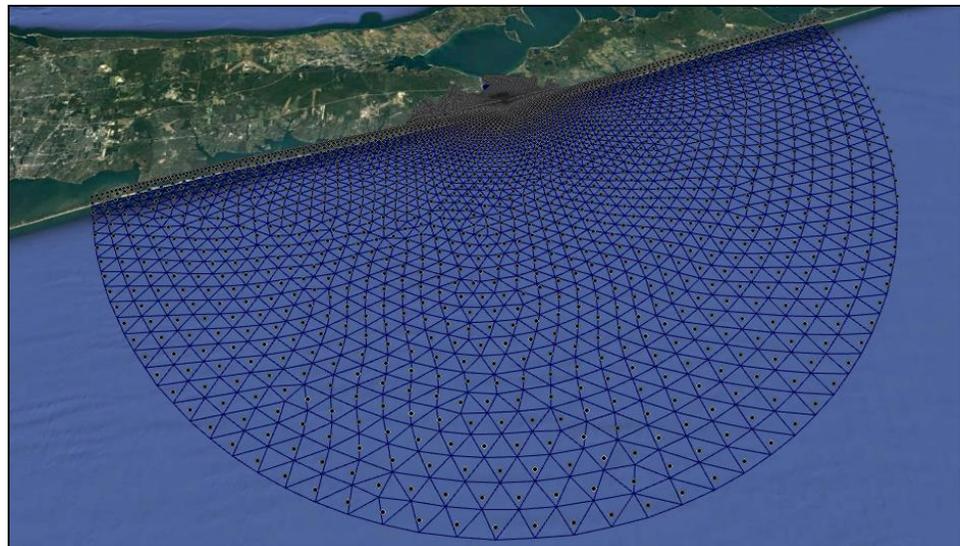


Figure 3 Vector KMZ file as shown in Google Earth

## 5 Differences Between Raster and Vector KMZ Files

In order to better show the differences between raster files and vector files, it is important to zoom in to a closer section of the mesh in Google Earth.

1. In Google Earth, turn on “SMS – Raster” and turn off “Vector.kmz”.
2. Zoom in to the mouth of Shinnecock Bay and notice how the mesh is very pixilated and the image is not very clear (Figure 4).

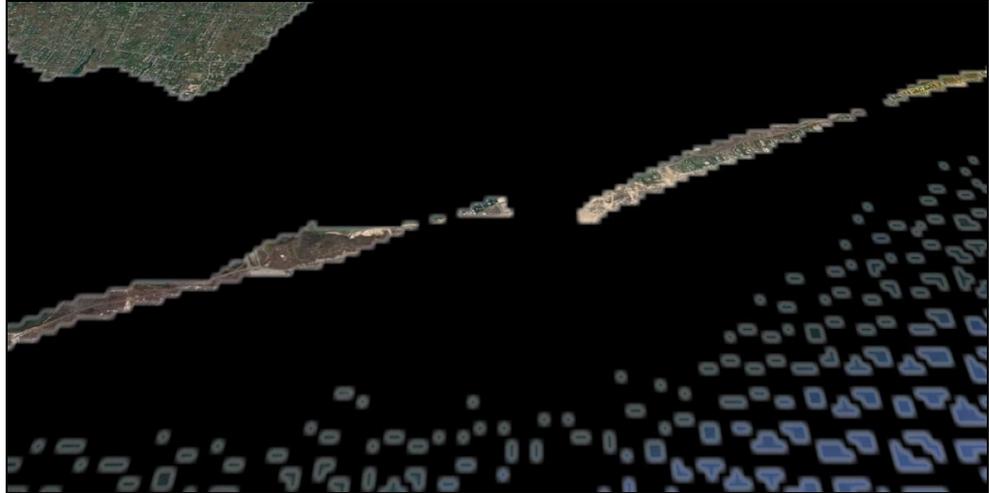


Figure 4 Raster KMZ zoomed in

3. Turn off “SMS – Raster” and turn on “Vector.kmz”.
4. Notice how the image is much clearer and detailed, and the mesh can be clearly seen (Figure 5).

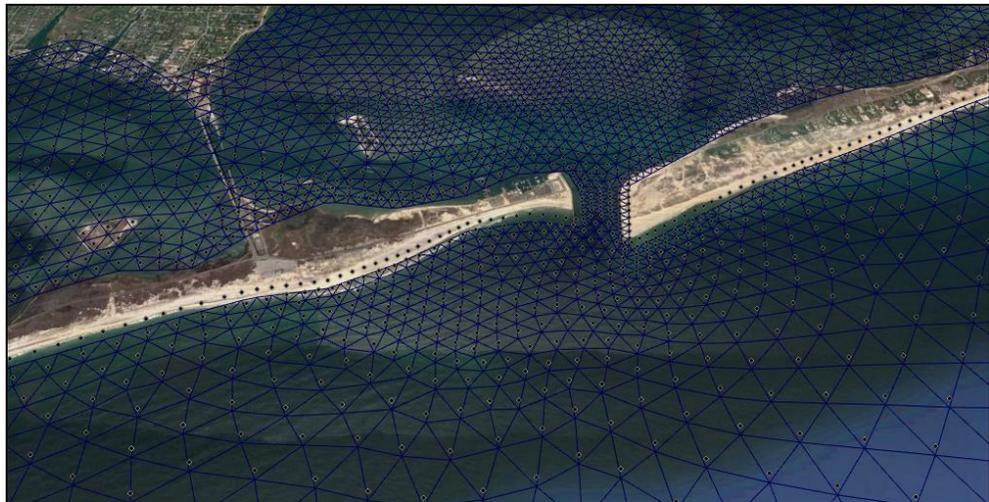


Figure 5 Vector KMZ zoomed in

There is a trade-off between raster and vector KMZ files. Raster KMZ files export more quickly but have a lower resolution. Vector KMZ files export more slowly but have a higher resolution. Because of this, a vector file is most useful when viewing small areas, and a raster file is better when viewing larger areas.

## 6 Saving the File with Contours Enabled

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To show other available views of data, the file can be saved with linear contours enabled. Color filled contours cannot be saved as a vector KMZ file. Color filled contours can only be saved as raster KMZ files.

1. In SMS, click **Display Options**  to open the *Display Options* dialog.
2. Select “2D Mesh” from the list on the left.
3. On the *2D Mesh* tab, click **All Off** and then turn on *Contours*.
4. On the *Contour* tab, in the *Contour method* section, select “Linear” from the first drop-down.
5. In the *Contour interval* section, select “Number” from the drop-down and enter “40” in the field to the right.
6. Click **OK** to close the *Display Options* dialog.
7. Select *File* | **Save As...** to bring up the *Save As* dialog.
8. Select “Google Earth Vector KMZ File (\*.kmz)” from the *Save as type* drop-down.
9. Enter “Contours.kmz” as the *File name* and click **Save** to export the vector KMZ file and close the *Save As* dialog.
10. In Windows Explorer, double-click “Contours.kmz” to open it in Google Earth.

The vector contours should appear similar to Figure 6.

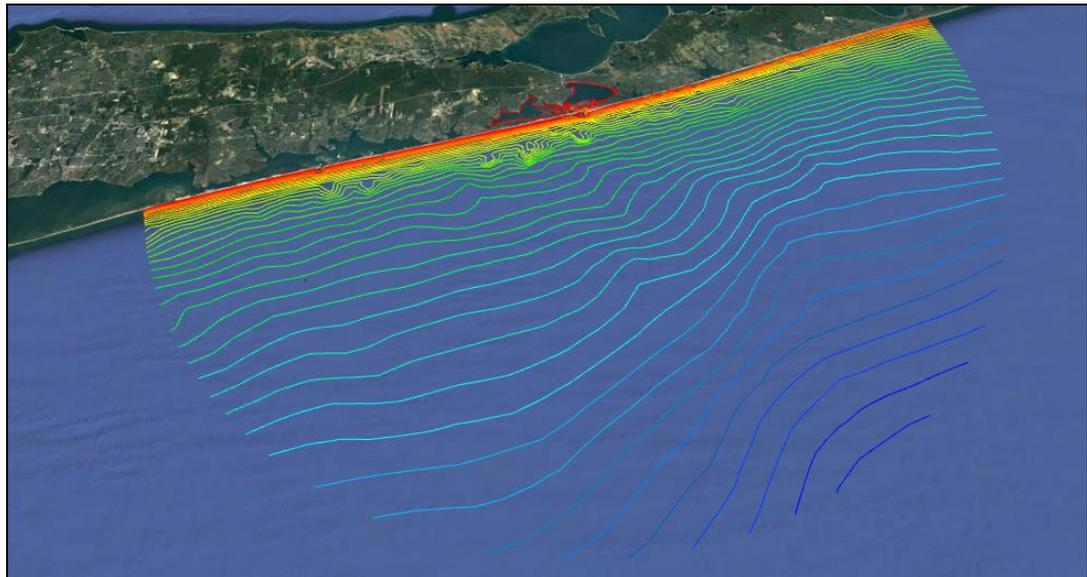


Figure 6 Vector KMZ file shown in Google Earth with contours active

## 7 Exporting KMZ Transient Data Animation

It is also possible to export a KMZ transient data animation using the *Film Loop Wizard*. This exports a series of raster images which can be animated in Google Earth. While the background color can be specified in the *Film Loop Wizard*, it is recommended that the option for no background be used so the Earth can be seen through the overlaid image in

Google Earth. SMS requires being in plan view to export a KMZ transient data animation.

First, to change the *Display Options* of the dataset in order to better view animation in Google Earth:

1. In SMS, click **Display Options**  to open the *Display Options* dialog.
2. Select “2D Mesh” from the list on the left.
3. On the *2D Mesh* tab, turn on *Vectors*. *Contours* should already be turned on.
4. On the *Contours* tab, in the *Contour method* section, select “Color Fill” from the first drop-down.
5. Enter “80” as the *Transparency*.
6. On the *Vectors* tab, in the *Arrow Options* section, enter “60” as the *Maximum*.
7. Click **OK** to close *Display Options* dialog.

To export a KMZ animation:

1. Select *Data | Film Loop...* to bring up the *General Options* page of the *Film Loop Setup* dialog.
2. In the *Select Film Loop Type* section, select *Transient Data Animation*.
3. In the *Film Loop Files* section, turn off *Create AVI File* and turn on *Create Google Earth KMZ File*.
4. Click the  button to bring up the *Save* dialog.
5. Enter “Animation.kmz” as the *File name* and click **Save** to close the *Save* dialog.
6. Click **Next** to go to the *Time Options* page of the *Film Loop Setup* dialog.
7. In the *Time Zone* section, turn on *Change Time Zone* and select “(GMT-05:00:00) America / New\_York (Eastern Standard Time)” from the drop-down.
8. In the *Zero Time* section, turn on *Change Zero Time* and enter “8/ 1/2000 8:00:00 AM” in the drop-down.
9. Click **Next** to go to the *Display Options* page of the *Film Loop Setup* dialog.
10. Click **Finish** to start generating the animation and close the *Film Loop Setup* dialog.
11. Turn off “Contours.kmz” in Google Earth so the animation can be viewed cleanly.

The animation KMZ file will open automatically in Google Earth. The animation controls should be in the top left corner. One frame of the animation KMZ in Google Earth is shown in Figure 7.

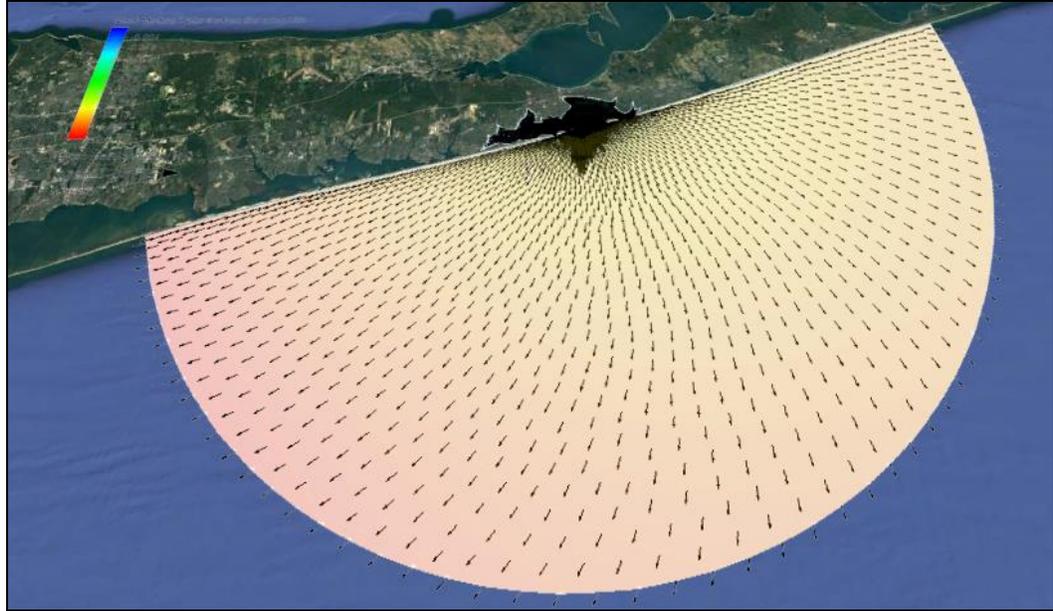


Figure 7 Frame from the animation KMZ imported into Google Earth

## 8 Conclusion

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This concludes the “Google Earth® Files” tutorial. Feel free to continue to experiment with creating KMZ files in SMS, or exit the program.