Exporting Plate Reconstructions as Image Files

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Aim

This tutorial is designed to teach GPlates 1.5 users how to (1) export screenshots of plate reconstructions as discrete images files, and (2) include timestamps on exported images.

Background

GPlates allows you to visualise plate reconstructions and raster data through geological time. It is possible to visualise this data independent of GPlates and save them as discrete image files. This is particularly helpful for analysing snapshots of reconstructed data and for creating figures and

presentations.

We will go through the basics of exporting a single image, exporting a series of images over a set timeframe, and adding a timestamp using GPlates which is otherwise absent in an exported image.

Included Files

[Click here](#) to download the data bundle for this tutorial.

The tutorial dataset includes the following files:

      Rotation file: Seton_etal_ESR2012_2012.1

      Coastlines file: Seton_etal_ESR2012_Coastline_2012.1

      Plate polygon file: Seton_etal_ESR2012_PP_2012.1

This tutorial dataset is compatible with GPlates 1.5.

# Exercise 1 – Loading data and exporting a single image file from GPlates

Open GPlates and load the desired datasets using Open Feature Collection. In this example, we will load the included tutorial data bundle which includes the Coastline, Dynamic Plate Polygons and rotation file for the Seton et al (2012) model (Figure 1):
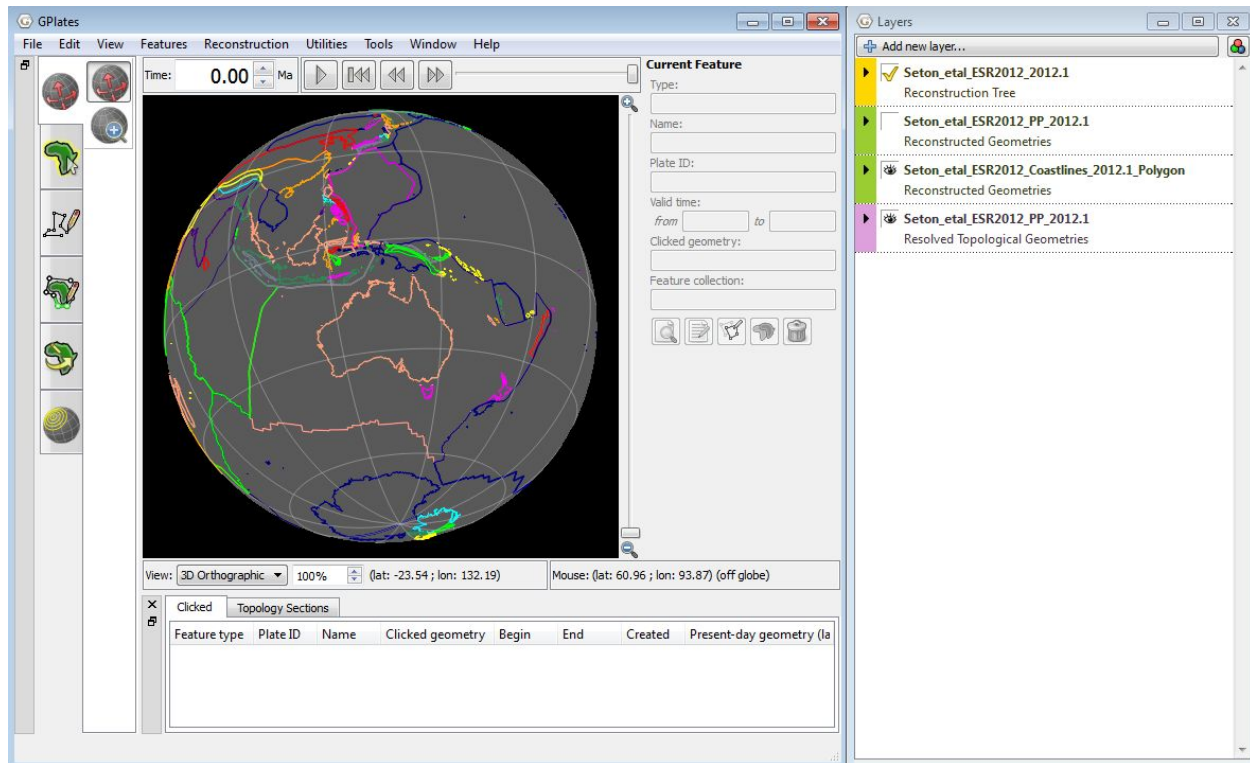
Seton_etal_ESR2012_Coastlines_2012.1.gpmlz
Seton_etal_ESR2012_PP_2012.1.gpmlz
Seton_etal_ESR2012_2012.1.rot
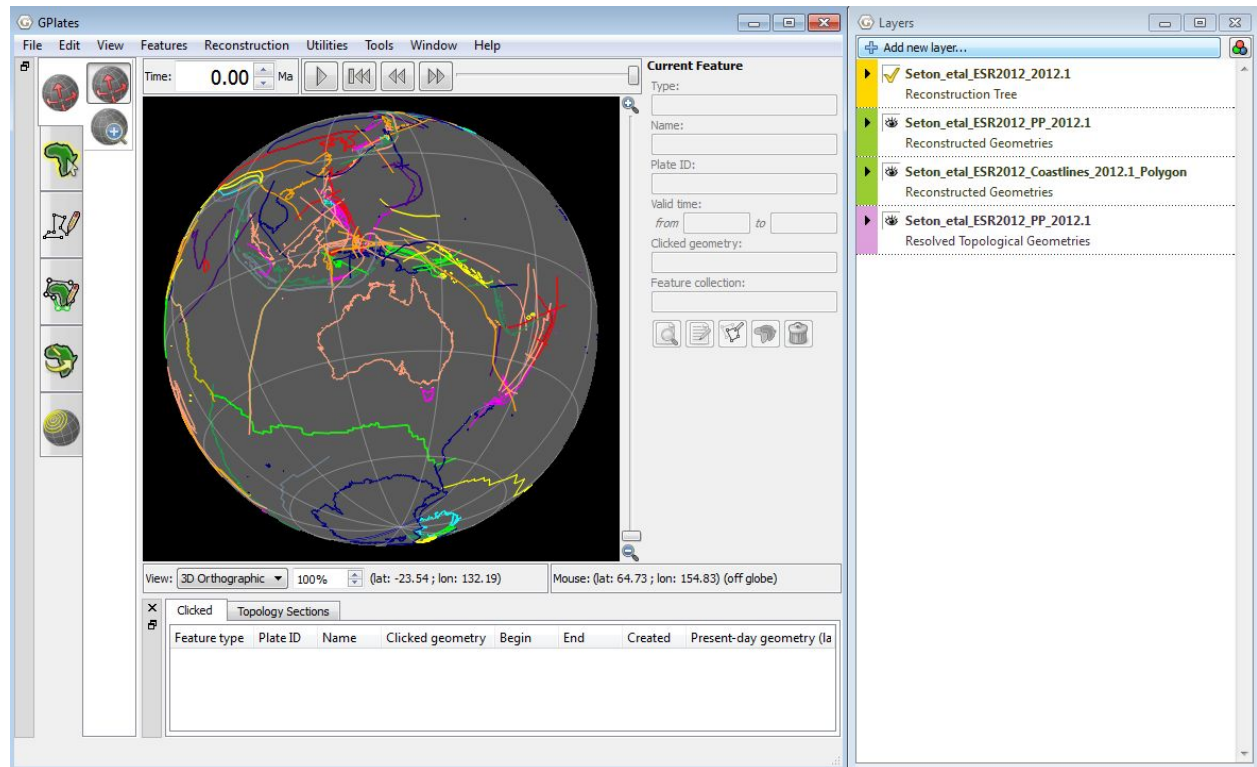
**Figure 1.** GPlates with the appropriate datasets loaded.

For clarity, turn off the plate boundary layer by clicking the eye in the Layers window to show only the resolved topologies and coastlines (Figure 2).

**Figure 2.** GPlates with the Seton et al PP plate boundary layer turned off.

In this exercise we will export only one screenshot to begin with. Drag the globe to the desired position you would like to screenshot. Additionally, use the time slider to reconstruct back to the time frame you would like to screenshot.

As an example, let's reconstruct to 131 Ma and focus on the location of India just as it breaks away from Gondwana along the mid-oceanic ridge. To more easily differentiate between the coastlines and the plate boundaries, recolour the coastlines silver using the Manage Colouring tool under the Features menu option (Figure 3).
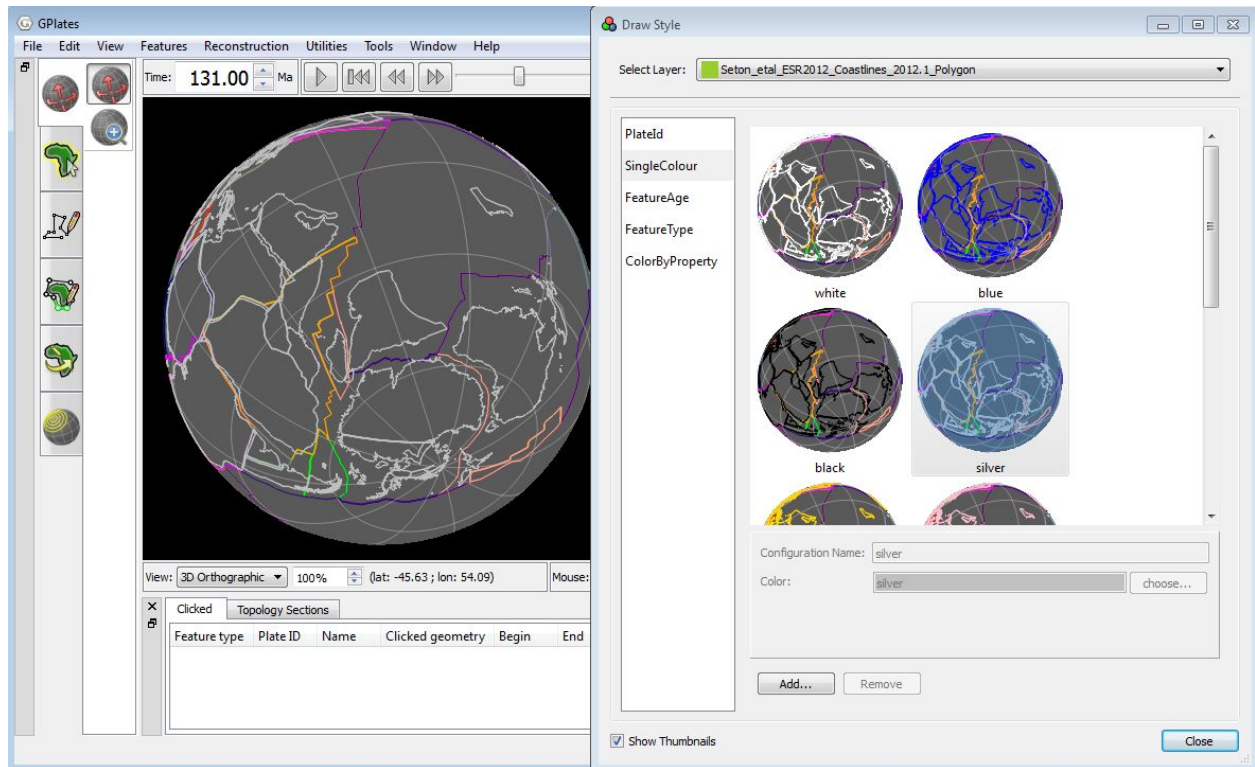
Figure 3. In the Manage Colouring window, select the Coastlines layer and recolour it as silver. India at 131 Ma is circled in black.

Select the option Export under the Reconstruction tab (Figure 4). The Export window will appear.
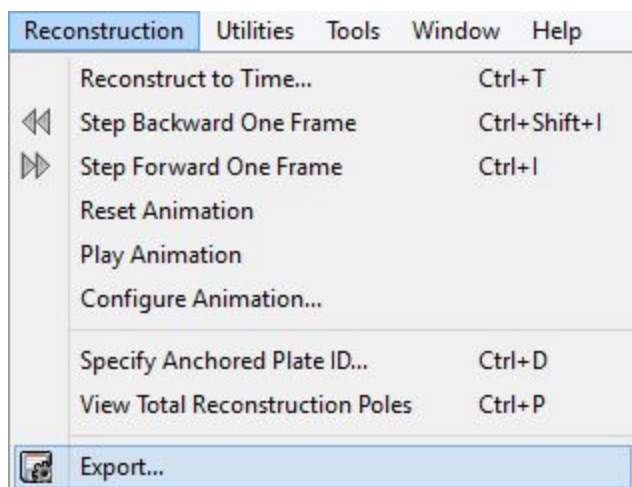
Figure 4. Select the option 'Export...' under the Reconstruction tab.

To create only one image, select 'Export Single Snapshot Instant'. Set the time instant to the year you wish to take a screenshot of (Figure 5). We will

set the time instant to 131 Ma. If you want to save the image to a particular location or folder, change the target directory by clicking on the '…' button beside the location name.
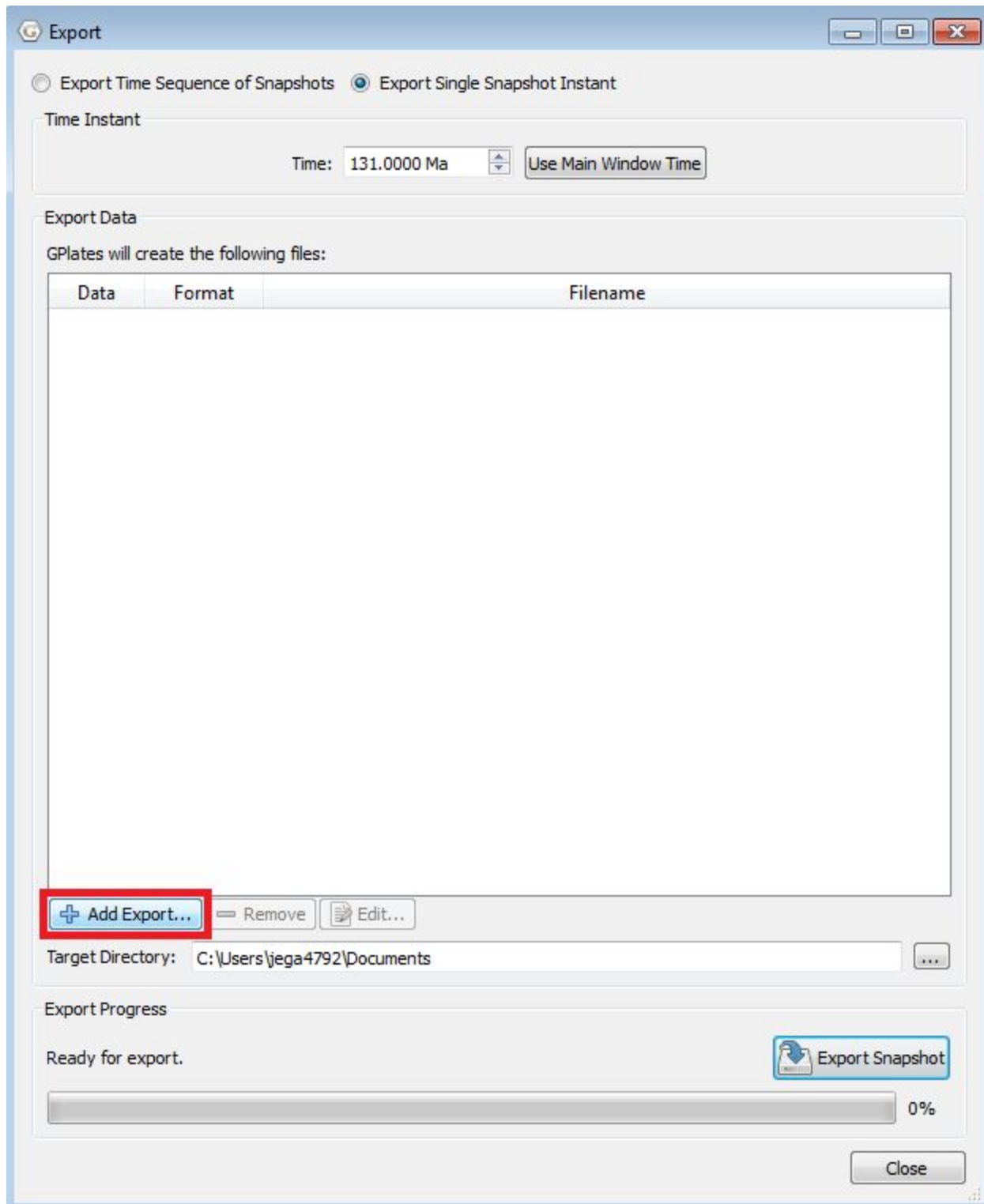
Figure 5. In the Export window, select 'Export Single Snapshot Instant' and specify the reconstruction year to 131 Ma. Specify the Target Directory to a preferred location using the '…' button.

The next step is to specify what we actually want this snapshot exported as. To do this, click on 'Add Export' which is just above the Target Directory section. This will open the Add Data to Export window where you are able to specify the file type, file name, and file size of your image.

Since we are going to export an image, select 'Image (screenshot)' under '1. Choose File to Export'. A list of image file types will appear under '2. Choose Output File Format'. Notice that if you experiment by selecting different data types, the types of image files available to you will also change. We will choose to export our image as a Portable Network Graphics (.png) file.

Once you select this, the '3. Configure Export Options' section will become available (Figure 6). Here you can specify the resolution of the image by selecting the width and height. By default, the width and height is set to the main GPlates window dimensions. If you wish to reset your width and height to this default, simply click the yellow arrow next to 'Use main window dimensions'. It is recommended that you tick the box for 'Constrain aspect ratio' in order to preserve the shape of the original reconstruction. Keep in mind that this will grey out the Height option, so if you desire an image with specific dimensions then leave the box unticked.
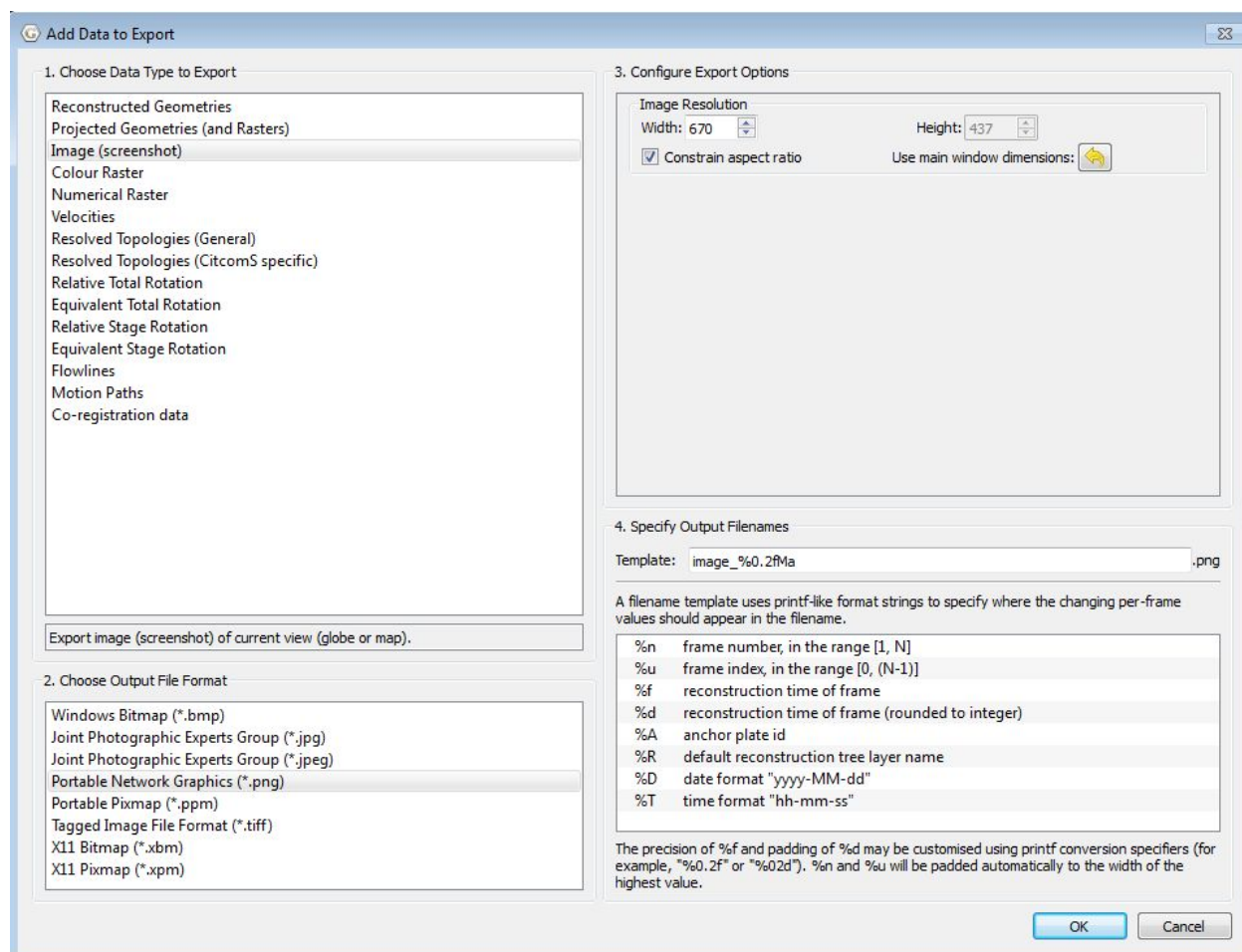
Figure 6. The 'Add Data to Export' window where we can specify the data type, output file format, export size/options and output filename templates for our image of India at 131 Ma.

The final section, '4. Specify Output File Names', already contains the default template 'raster_%0.2fMa' which we will keep. The meanings of these codes are explained in the legend underneath, but what it essentially means is that you can create a template for naming your images using these codes. GPlates will use this naming template to calculate a unique file name for every image you produce (although in this case we are only creating a single snapshot – this will make more sense later when we produce a whole lot at once). The default template name 'raster_%0.2fMa' will become 'raster_131.00Ma' once our image is exported.

Once you have specified these conditions, click OK.

After a little bit of time, you will see your newly added raster export data in the 'Export' window (Figure 7). If you wish to export additional file types along with your PNG file such as a JPEG, or one that is a different size to the

one you specified earlier, click 'Add Export' to add another image to the export list. Keep in mind that they will all be of India reconstructed at 131 Ma.
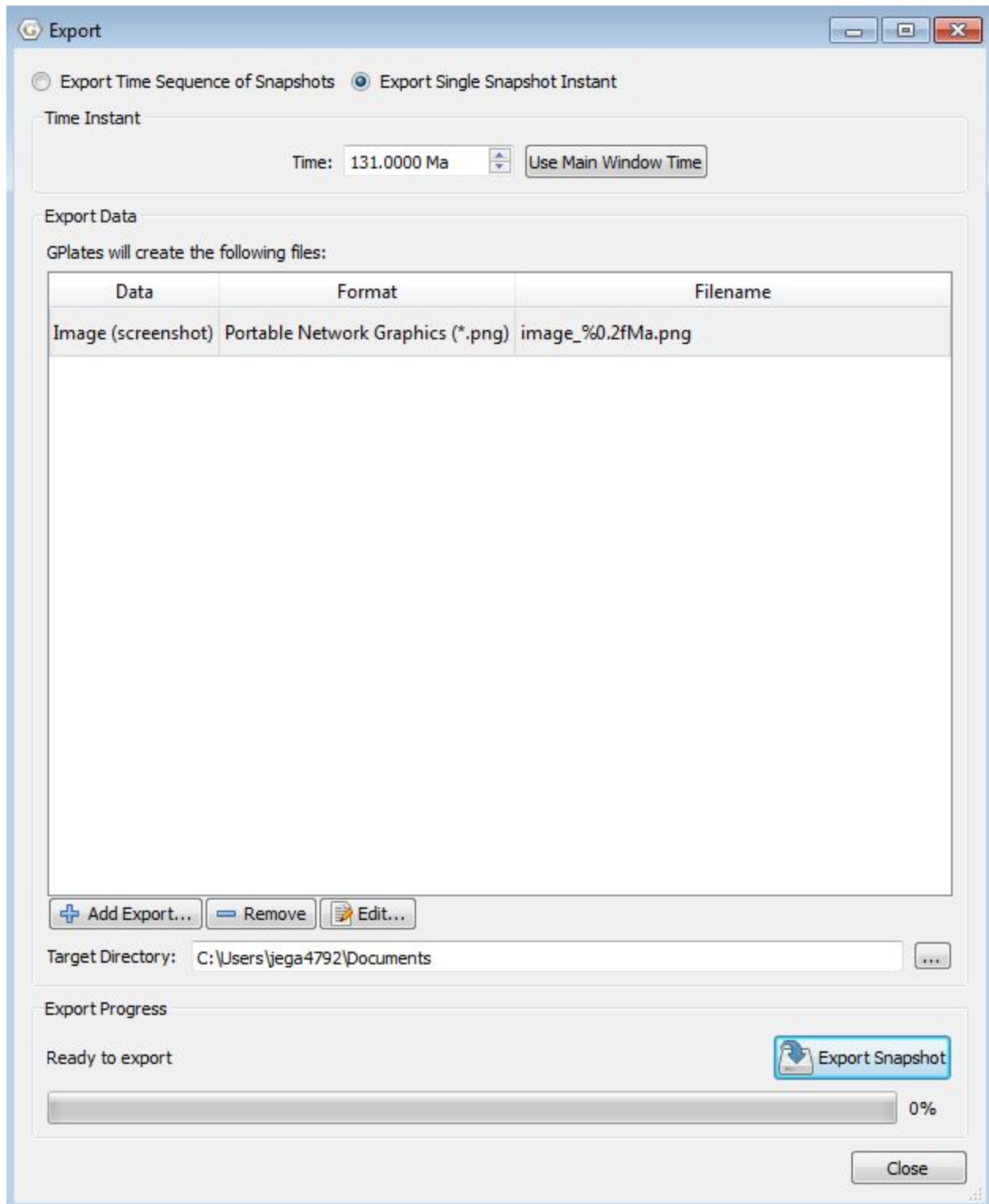
Figure 7. The 'Export' window with one Image (screenshot) data of PNG format loaded. It is now ready to be exported by clicking 'Export Snapshot'.

Ensure you have the correct target directory, and then click 'Export Snapshot'. Once it has completed exporting, the bar will turn completely green and show 100% completion. Navigate to the folder which you specified as the Target Directory where you will find your image named 'raster_131.00Ma' as a PNG file. Notice that the image also has a transparent background (Figure 8).
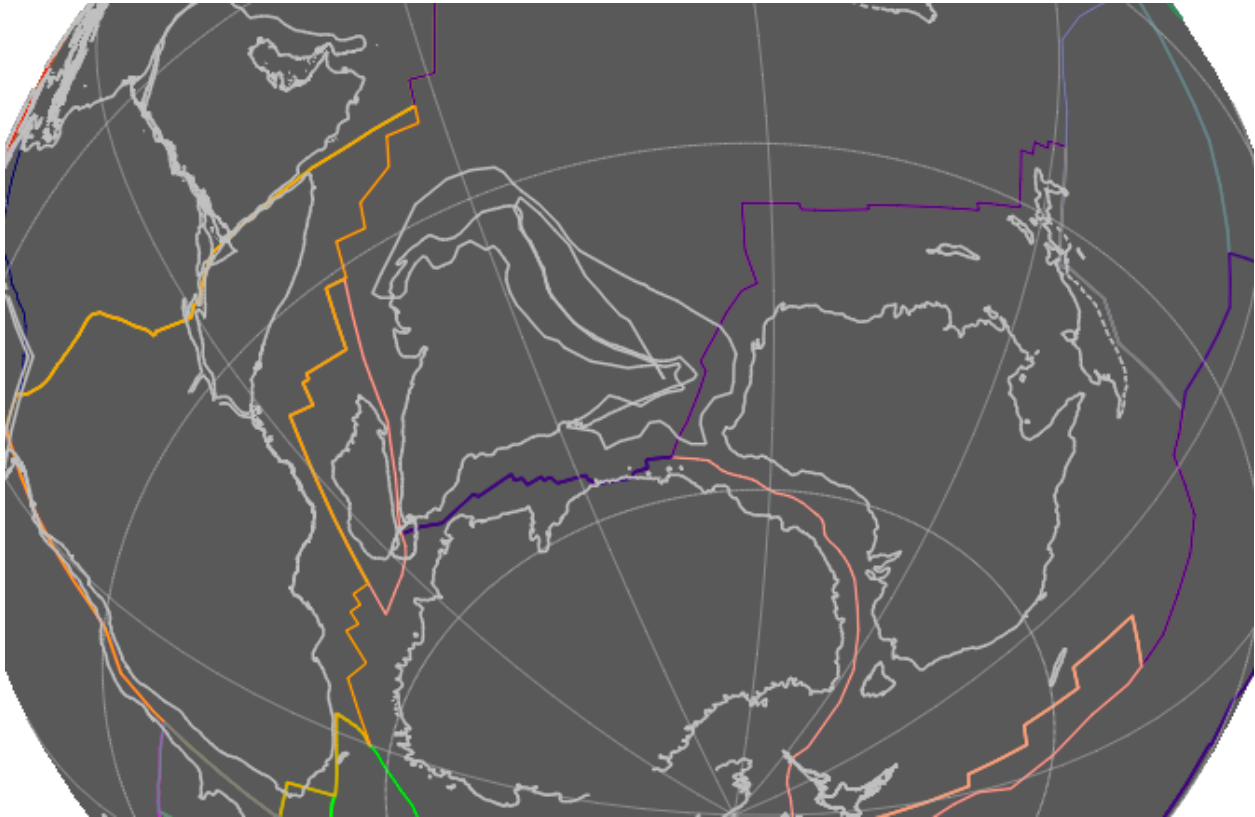
Figure 8. The exported PNG image file of India reconstructed at 131 Ma.

You have now learnt how to create an image file of a reconstruction using GPlates!

Exercise 2 – Exporting a series of reconstructions and

including a timestamp in GPlates

We will now export a series of reconstructions over a set period of time. You will notice that the first image we exported (Figure 7) did not have a timestamp. When producing a large amount of images spanning X to Y Ma, this lack of timestamp becomes very cumbersome. GPlates is able to add a digital timestamp to the GPlates main window which can be captured by the 'Export' tool, and works independently to the time slider.

To do this, select 'Configure Text Overlay…' under the View tab (Figure9). This will open the 'Configure Text Overlay' window.
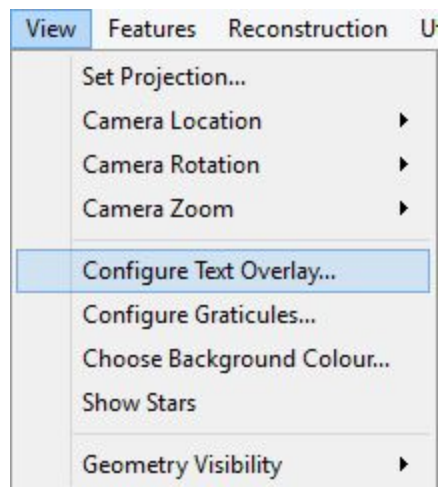
Figure 9. Select 'Configure Text Overlay' to add a timestamp to the GPlates man window.

Check the 'Enable Text Overlay' box to un-grey the interface. The default text to be overlaid is '%f Ma' which represents the current reconstruction time. Leave this as is.

Other properties you can specify are the number of decimal places, font, colour, anchor (the position of the text relative to the reconstruction interface), horizontal and vertical offset. You can play around until you achieve the perfect text overlay. It is recommended that you make the font size very large so that the timestamp is visible from a distance should you decide to put them in a PowerPoint presentation. We will set the font size to 36, and the font colour to white. Once you have finished configuring your text, click OK (Figure 10).
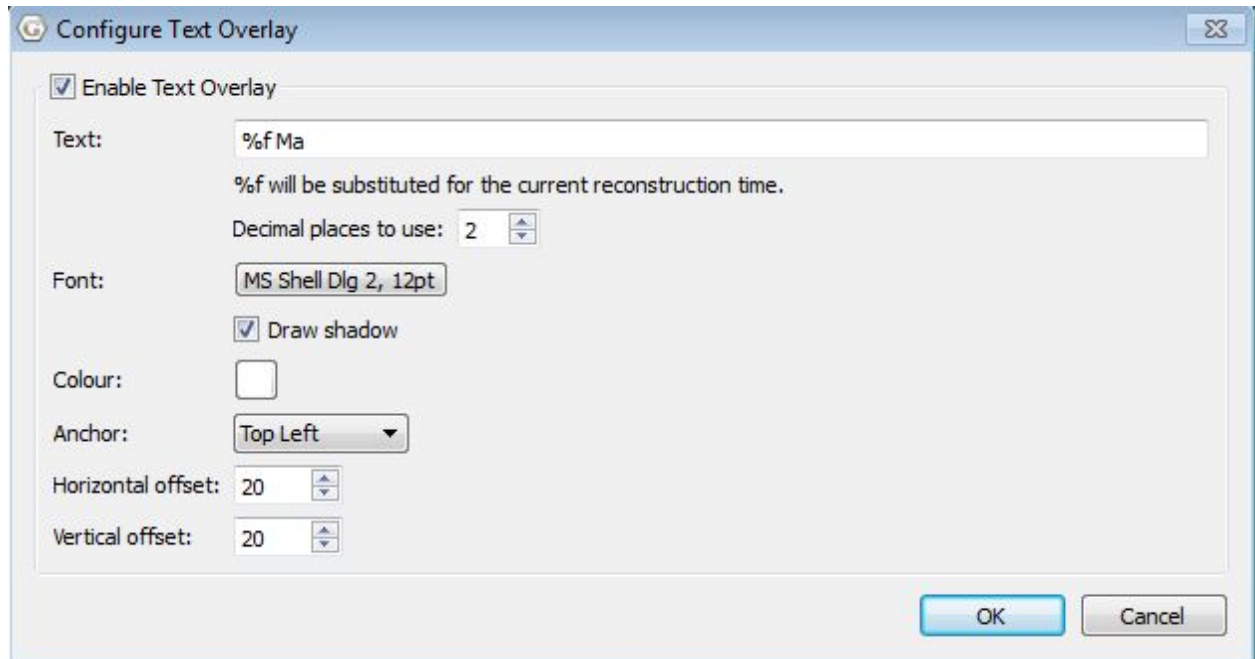
**Figure 10.** The 'Configure Text Overlay' window where you can specify properties of your timestamp text.

You will now see a timestamp in the location you have specified, the default being Top Right, on the GPlates main window (Figure 11). Try adjusting the reconstruction time using the time slider – you will see that the reconstruction time matches up with the overlaid timestamp that we have just inserted.
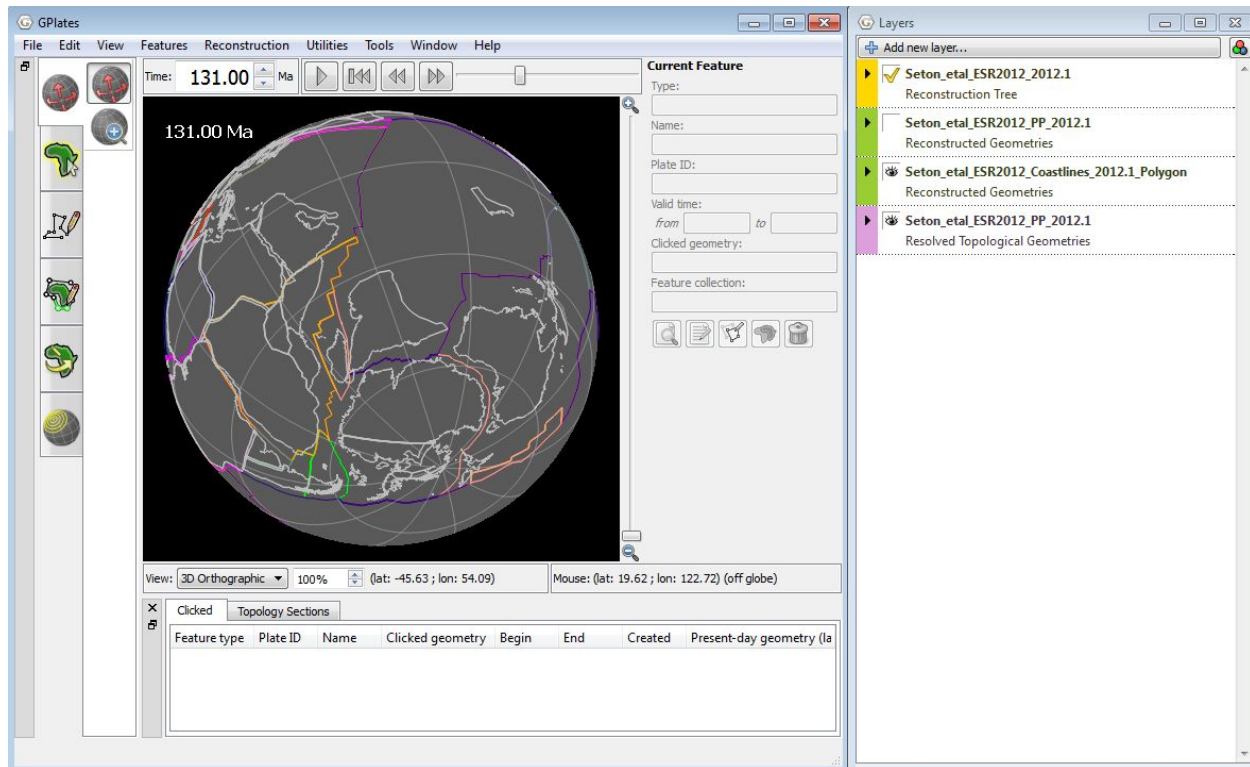
Figure 11. The GPlates main window showing a timestamp of 131 Ma.

Now we will export a series of ten images focusing on the northward movement of India following its breakup from Gondwana, reconstructed from 131 Ma to 122 Ma, with timestamps included. This can be done in almost the exact same way as exporting a single image.

Set the reconstruction time to 131 Ma and centre in on India as before. Select the option Export under the Reconstruction tab, and in the Export window, select 'Export Time Sequence of Snapshots'. Now we must specify from what reconstruction time to animate, and to when it should stop. Change 'Animate from' and 'to' to 131 Ma and 122 Ma respectively. Keep the increment of 1 Myr per frame (Figure 12).
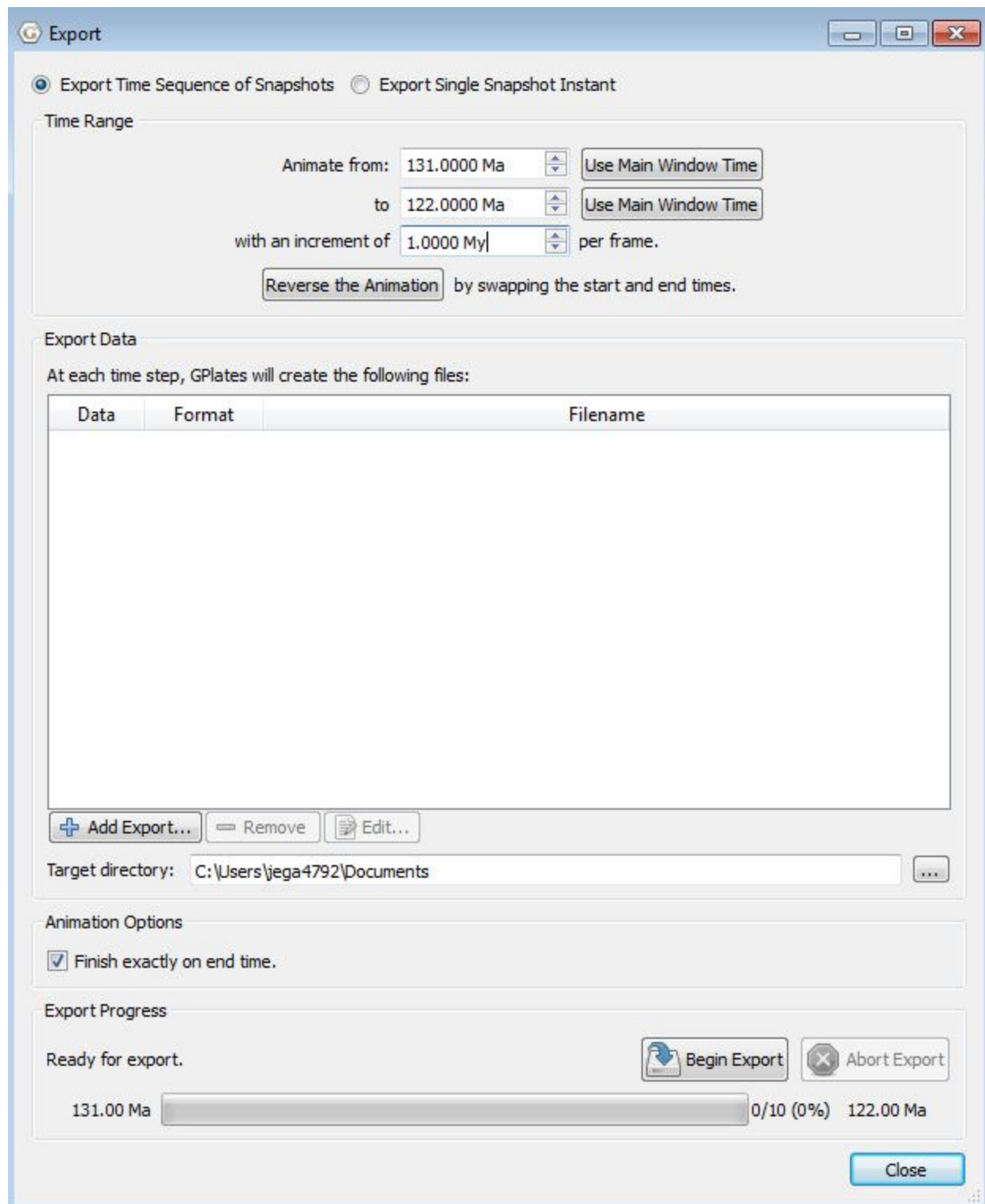
Figure 12. Choose the option 'Export Time Series of Snapshots' in the Export window, and specify the time range in which you want your images to span.

Use the 'Add Export' button to add data as you did in Exercise 1. Since you

are exporting images, select 'Image (screenshot)' as the data type and choose an image file type. We will use PNG again.

Once you have finished specifying these all the file conditions, click OK. Now ensure the target directly is correct, and that your new export data is loaded. Click 'Begin Animation'. GPlates will take some time to export these images because it must first reconstruct the image in the main window. Once it has reached 100%, click 'Close' and open up the target directory to find your files. You will see 10 individual PNG images, with timestamps included, of India moving away from Gondwana between 131 Ma and 122 Ma. Below are selected images for 130 Ma, 126 Ma and 122 Ma (Figure 13).
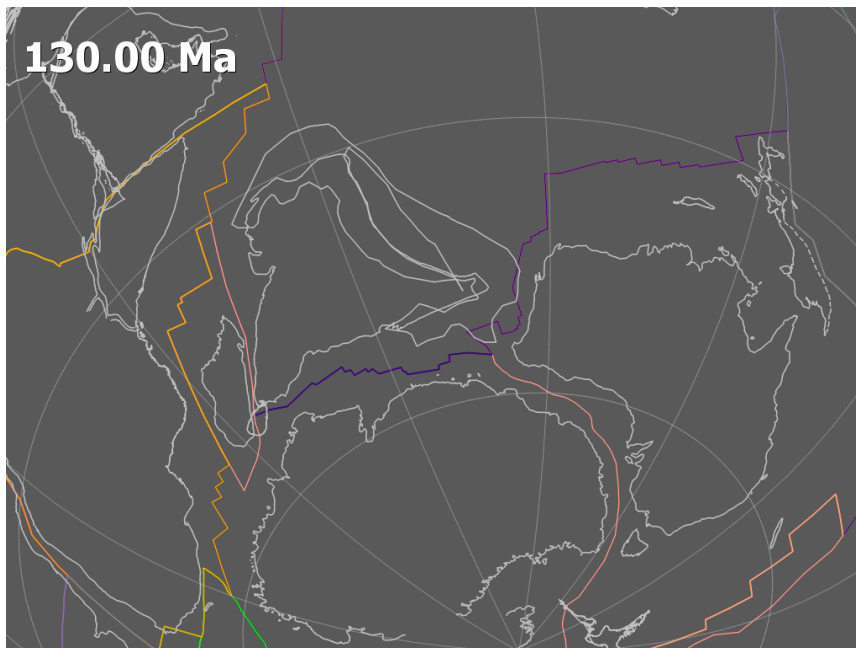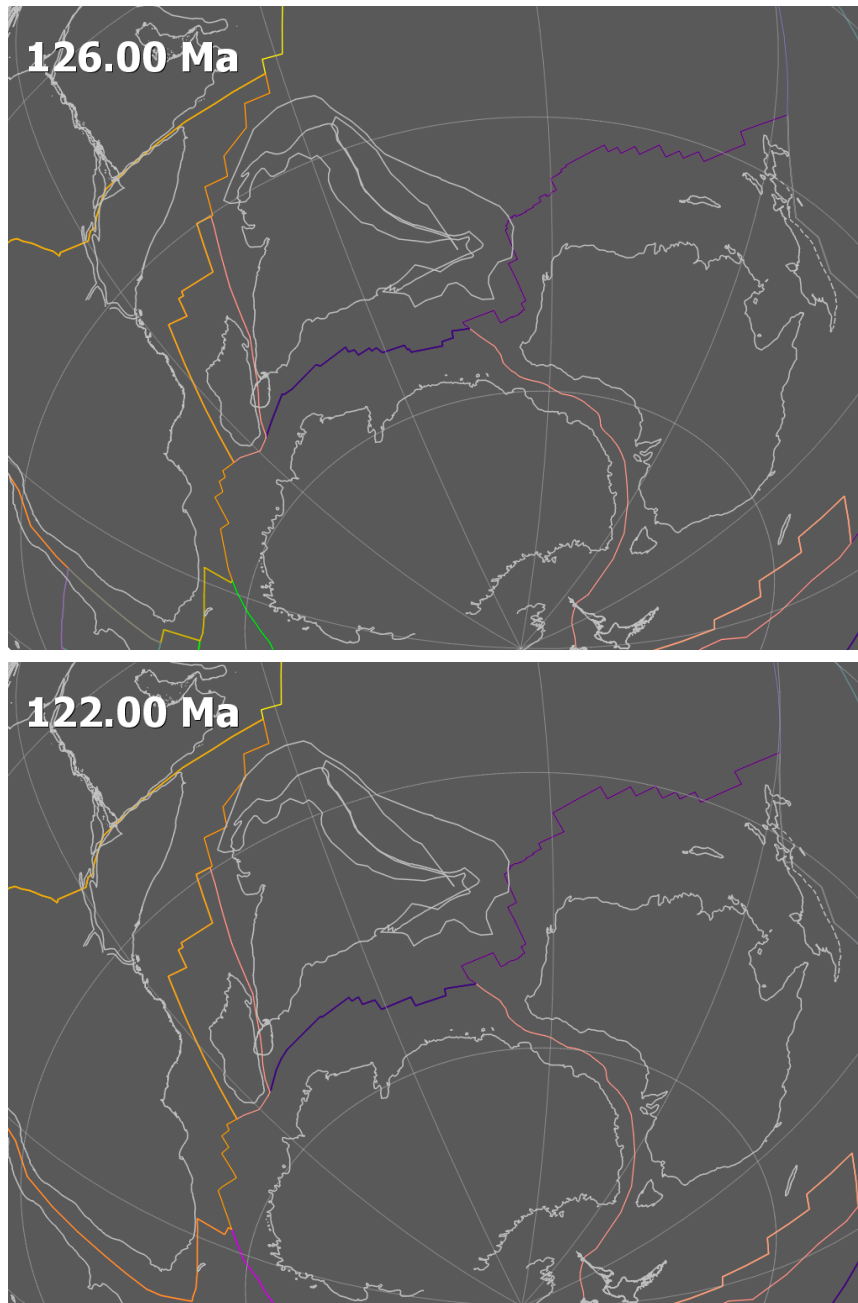
Figure 13. Exported images of India reconstructed at 130 Ma, 126 Ma and 122 Ma.

You have now learnt how to export a series of reconstructions as image files using GPlates!

In our next tutorial, you will learn how to turn a set of exported GPlates reconstructions, such as the images of India we have just created, into a separate time-lapse animation which reconstructs backwards and forwards through time and is viewed independently of GPlates.