

Moving PIPs Manual

(updated August 30, 2019)

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PART I: Introduction

Intro

A moving PIP (Picture-in-Picture) is a PIP that automatically moves on an SOS dataset as the dataset is animating. In order for the PIP to move, a simple path file that contains frame numbers and latitude/longitude coordinates is linked to the PIP.

As an example, if you have a dataset showing the movement of a hurricane, and if you have the coordinates for the hurricane, you could add a PIP image to your dataset (perhaps a small hurricane symbol) and add the path file to the PIP, and the PIP will follow the hurricane.

Moving PIPs provide flexibility in that you do not have to embed moving data into global images/video and you can make edits to the PIP path file without having to edit the global image/video data.

Moving PIPs are available starting with SOS version 5.4.

Documentation

Brief documentation for moving PIPs can be found on the *SOS Website > Support tab > Manuals menu* in the following manuals. Note that this document contains the most comprehensive information on moving PIPs.

- [Datasets Manual](#)
- [Visual Playlist Editor Manual](#)

PART II: The Path File

Path File Format

To make a PIP move on SOS, you simply have to attach a path file to a PIP so that the PIP will automatically move as the dataset is animating. The path file is a simple csv (comma separated value) file where each line in the file consists of three fields.

```
frame#,lat,lon
frame#,lat,lon
frame#,lat,lon
frame#,lat,lon
.
.
.
```

As the dataset is animating, the PIP will be moved to the `lat,lon` coordinate location that corresponds to the current frame being shown on SOS.

Important (please read):

- There should be no column labels or other extraneous data at the top of the csv file.
- Each line of the csv file must have exactly three numerical values separated by a total of two commas.
- Each field can only be a numerical value (ex. `10, -25.0, 32`). There should be no letters or special characters in any of the fields. The first field, which is the frame number, should only be an integer (no decimal point).
- If your latitude or longitude data has directional labels such as N, E, S, or W, the labels should be removed and the S and the W values should be converted to their negative number representations (ex. `25°S` should be converted to `-25`).

Frame Numbers

- A dataset's default start frame number is 0 (not 1). So, if you want your PIP to show up on the very first frame of the dataset, the first frame number in your csv file should be 0.
- A moving PIP will not be displayed until it reaches the first frame number in the csv file, and it will disappear after the last frame number in the csv file.
 - So, for example, if your dataset has 600 frames of data, and in your csv file, the first `frame#` you specify is 100, your moving PIP will not show up until the dataset animation reaches frame 100.
 - Similarly, if the last `frame#` in your csv file is 400, your moving PIP will disappear when the animation reaches frame 400.
- There does not have to be a corresponding `lat, lon` location for every frame in the dataset. There can be gaps in the frame numbers. For example, the following is valid:

```
212, 25, 172
213, 26, 173
225, 43, 176
226, 44, 175
228, 45, 170
```

This means that when the dataset reaches frame number 213, the moving PIP will remain at location 26, 173 until the animation reaches frame number 225, at which time the PIP will be moved to location 43, 176.

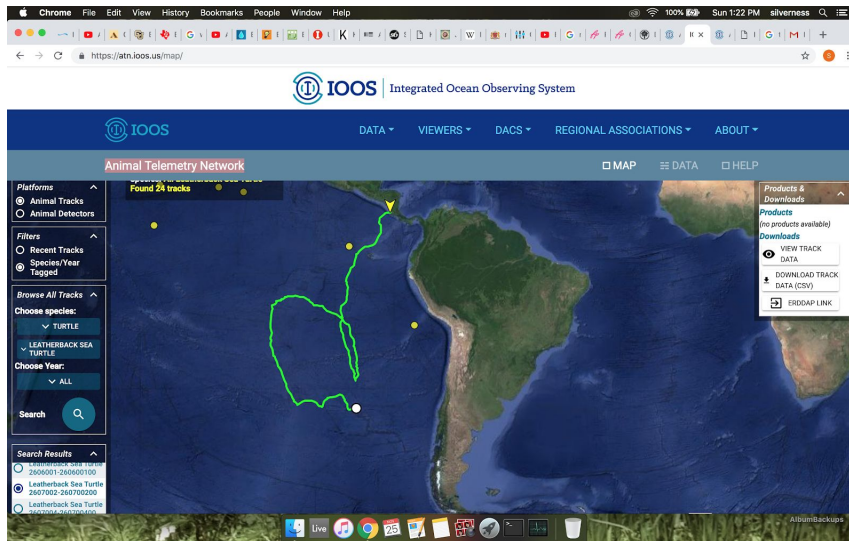
PART III: Complete Example

Creating a Moving PIP Path File

I wanted to display the track of a leatherback turtle on SOS, so, I did a Google search for animal migration data, which lead me to the Integrated Ocean Observing System website, which contains animal telemetry data:

<https://atn.ioos.us/map/>

I selected a few options on the left-hand side toolbar, which displayed this track:



Then, from the right-hand side toolbar, I downloaded the following track file (which already happened to be in a csv file format):

`stanford_import_ssm_public_6ff4_4d83_2b6c.csv`

(excerpt from beginning of file)

latitude	longitude	time	genus	common_name	species	event_id	workgroup	topp_id	deploy_year	time_coverage_start	time_coverage_end
degrees_north	degrees_east	UTC								UTC	UTC
10.339996	-85.85	2007-01-24T00:00:00	Demochelys	Leatherback Sea Turtle	coriacea	260700200	Turtle	2607002	2007	2007-01-24T00:00:00	2008-06-05T00:00:00
10.330002	-85.84	2007-01-25T00:00:00	Demochelys	Leatherback Sea Turtle	coriacea	260700200	Turtle	2607002	2007	2007-01-24T00:00:00	2008-06-05T00:00:00
10.330002	-85.84	2007-01-26T00:00:00	Demochelys	Leatherback Sea Turtle	coriacea	260700200	Turtle	2607002	2007	2007-01-24T00:00:00	2008-06-05T00:00:00
10.330002	-85.84	2007-01-27T00:00:00	Demochelys	Leatherback Sea Turtle	coriacea	260700200	Turtle	2607002	2007	2007-01-24T00:00:00	2008-06-05T00:00:00
10.339996	-85.84	2007-01-28T00:00:00	Demochelys	Leatherback Sea Turtle	coriacea	260700200	Turtle	2607002	2007	2007-01-24T00:00:00	2008-06-05T00:00:00
10.32	-85.85	2007-01-29T00:00:00	Demochelys	Leatherback Sea Turtle	coriacea	260700200	Turtle	2607002	2007	2007-01-24T00:00:00	2008-06-05T00:00:00
10.330002	-86.02	2007-01-30T00:00:00	Demochelys	Leatherback Sea Turtle	coriacea	260700200	Turtle	2607002	2007	2007-01-24T00:00:00	2008-06-05T00:00:00
10.410004	-86.43	2007-01-31T00:00:00	Demochelys	Leatherback Sea Turtle	coriacea	260700200	Turtle	2607002	2007	2007-01-24T00:00:00	2008-06-05T00:00:00

For convenience (and also so that I would have a copy of the original file in case I needed it for later or wanted to start over), I copied the file to a new file called

`leatherback.csv`

I then opened `leatherback.csv` into an Excel spreadsheet (open it in csv mode) and edited the track data to be in the format that a moving pip requires (i.e. removed all column labels and removed all columns of data except for the latitude and longitude columns, and then added a new column of data (the first column) with sequential frame numbers in them). An excerpt from the beginning of my final `leatherback.csv` file looks like the following in Excel:

0	10.34	-85.85
1	10.33	-85.84
2	10.33	-85.84
3	10.33	-85.84
4	10.34	-85.84
5	10.32	-85.85
6	10.33	-86.02
7	10.41	-86.43

As a side note, because the file was opened and/or saved using the csv file format, when I view the file in a simple text editor like TextEdit or Gedit, the file should look like this excerpt (i.e. fields separated by commas):

```
0,10.34,-85.85
1,10.33,-85.84
2,10.33,-85.84
3,10.33,-85.84
4,10.34,-85.84
5,10.32,-85.85
6,10.33,-86.02
7,10.41,-86.43
```

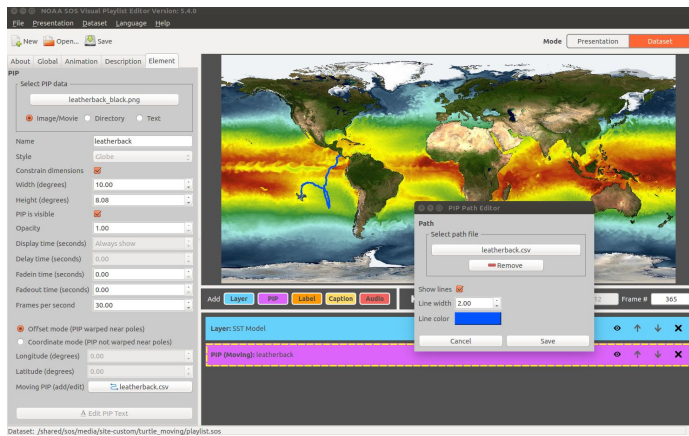
The above data is interpreted as: When the SOS dataset animation reaches frame number 6, the turtle PIP will be positioned at latitude 10.33 and longitude -86.02.

Adding a Moving PIP to an SOS Dataset

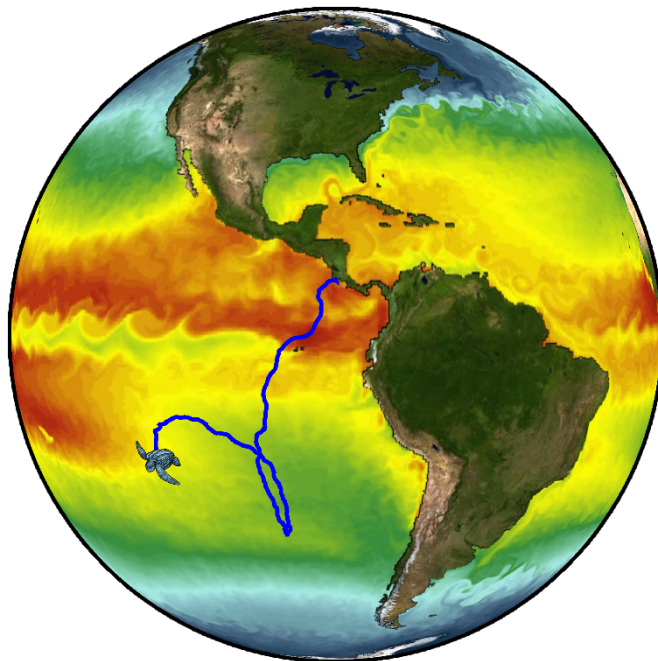
Once my moving PIP path file was in its correct format, I was ready to create an SOS dataset. Using the SOS Visual Playlist Editor (VPLE), I created a site-custom dataset by adding a Layer of a sea surface temperature movie that I found in the SOS Data Catalog, and then I added a PIP image of a leatherback turtle that I found online.

(For more information on how to use the VPLE to create a custom SOS dataset, please see the VPLE video tutorials on the [SOS Website > Support tab > Resources menu > Video Tutorials page](#), or read through the [SOS Website > Support tab > Manuals menu > VPLE Manual's Create a New Dataset section](#).)

To make my PIP move, I needed to link my csv path file to the PIP. So, in the Element tab for the turtle PIP, I clicked on the button next to the “Moving PIP (add/edit)” field to add the `leatherback.csv` file and to specify the line color and size of the line. If you don’t want a line, simply uncheck the line box. Click Save to save your changes. (See the [Create Moving PIPs](#) section in the VPLE manual for more information.)



When I finished creating and saving my dataset in the VPLE, I loaded the dataset onto SOS and the turtle started to move as the dataset was animating, as shown in the following screenshot (which shows the turtle PIP three-fourths of the way through its track).



Note that this was just one workflow for getting coordinate data into a moving PIP path file format. In the above turtle migration example, the global sea surface temperature movie data does not match or tie in to the actual migration pattern of the turtle track data. The two were paired in order to show a simple example of moving PIPs.

Many global datasets have timestamps, and many migration tracks also have timestamps. With a little more effort, you can find ways to match the data so that there is a clear and accurate tie-in between the global data and the track data.