

# Tutorial: Extracting frames from videos and annotating images with Photoshop

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This tutorial shows how you can create labels (1), extract frames from videos (2) and match them to recorded coordinates (3), annotate images (4) and quickly save annotated images (5). With the two accompanying functions (“ImageArea”, and “PercentCover” for R and Matlab), you can quickly calculate the area of the image using laser dots and the percentage of cover of each of the annotated categories, resp.

Deep-sea images credit JC073 Changing Oceans Research Expedition 2012

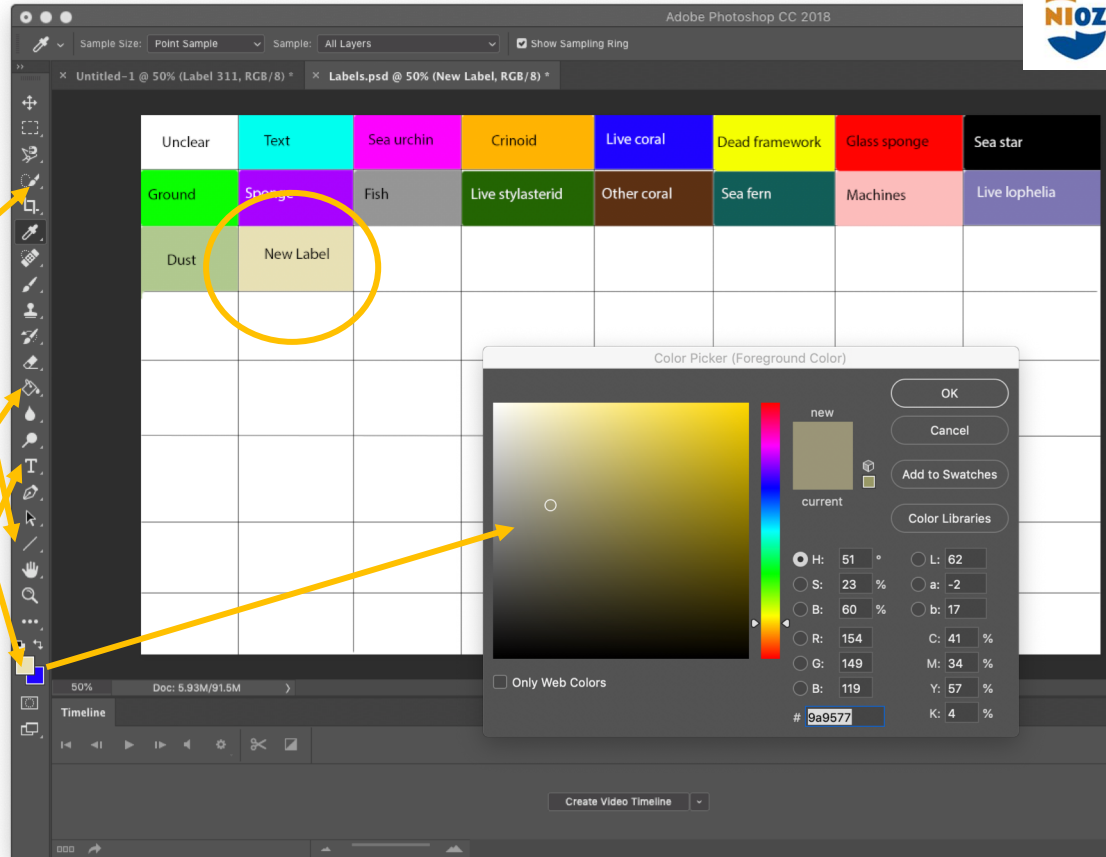
# Section 1: create labels in Photoshop

Before you start annotating the image, you need to specify the labels of the species/categories that you want to label. These categories need a unique colour that you use consistently for that category throughout your annotations. You will often go back to these labels, in order to select the right colour when annotating the images.

Note: if you use a slightly different shade of e.g. red in images, for the same category, the functions will think these are different categories.

Note that you can always add labels.

1. Open a new file in Photoshop.
2. Divide your canvas into layers, e.g. with the line tool.
3. You can add labels by choosing a new label colour.
4. Select a rectangle with the Quick-Selection tool
5. Colour it in with the Paint-Bucket Tool
6. Add text and change the text-colour
7. Deselect by right-clicking with the Quick-selection tool

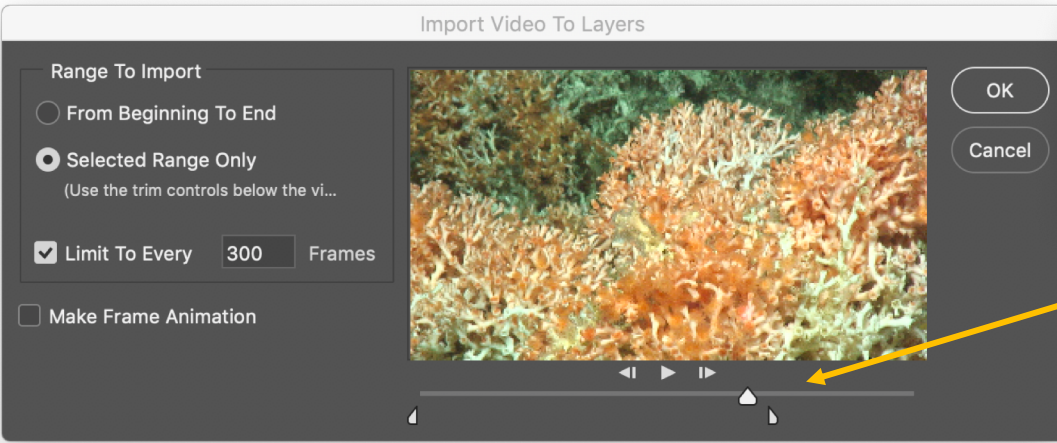


## Section 2: Extract frames from videos

To annotate sections of a video-transect, we will first have to extract images from the video. We can, for example, extract every 300<sup>th</sup> video frame. With a frame rate of 30 frames per second (you can find the frame rate in the details of your video), we will thus extract a still image every  $300/30 = 10$  seconds. This is important information to know, in order to match the frame to the coordinates (e.g. longitude-latitude, if these are not shown in your video).

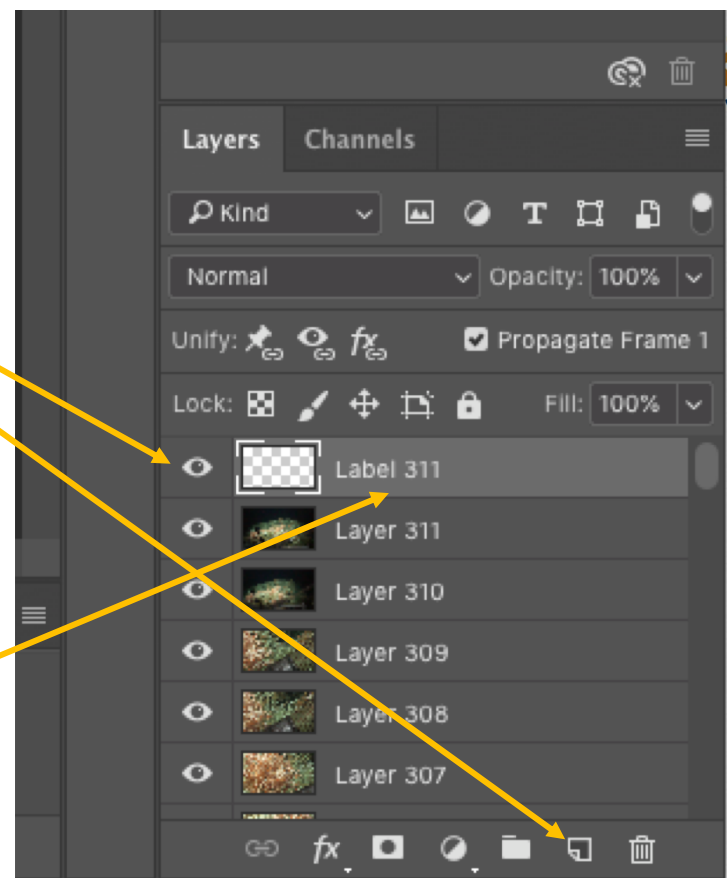


1. In Photoshop: Go to File → Import → Video Frames to Layers...
2. Select the video
3. Select: Selected Range Only and specify the range you want to import, with the arrows under the video-image. Limit the import range to every so-many frames (e.g. 300). Note: write this number down, because you need it to calculate the coordinates of the image.
4. If you get the message that frames will be limited to 500, increase the number of frames or decrease the range.



Select video range with the species/habitat/region of interest to import.

1. Frames are stored as layers in one file.
2. You can click on the eye next to a layer to make it invisible.
3. To label an image you need to create a new layer. This will be transparent.
4. You need to drag them above the layer you want to label. Then change their name to "Label XX", by slowly double clicking on the text. XX is the number of the layer you are labelling.



## Section 3: Get the coordinates of each frame

An important step to be able to use your annotations directly for analyses, is to get the coordinates of each image. In some videos coordinates are shown at the top, but for some videos you will only have a file with recorded coordinates. We will show you how you can get the correct coordinates in the latter case.

1. Your coordinates may be recorded with a time-stamp ('SourceTime').
2. From the start-time of the video, calculate the 'VideoTime' that corresponds to the 'SourceTime'.
3. Using the frame rate (FPS), calculate the frame corresponding to the 'VideoTime'.
4. Calculate the corresponding layer number. Here we extracted every 500<sup>th</sup> frame in Photoshop. Every whole number (1, 2, 3, etc.) will be an extracted layer.
5. Alternatively, you can also calculate the layer number directly from the time. E.g. if you extracted every 10 seconds.

Video start time

VideoTime	SourceTime	Lon	Lat
00:00:00	12:30:24	55.49468	-15.82725
=E2+F3-F2	12:30:25	55.49469	-15.82726
00:00:02	12:30:26	55.49468	-15.82726
00:00:03	12:30:27	55.49468	-15.82726

=D2+\$M\$5*(SECOND(E3-E2)+60*MINUTE(E3-E2)+3600*HOUR(E3-E2))										
D	E	F	G	H	I	J	K	L	M	
Frame	VideoTime	SourceTime	Lon	Lat	h	m	s			
0	00:00:00	12:30:24	55.49468	-15.82725	12	30	24			
E2)	00:00:01	12:30:25	55.49469	-15.82726	12	30	25			
50	00:00:02	12:30:26	55.49468	-15.82726	12	30	26			
75	00:00:03	12:30:27	55.49468	-15.82726	12	30	27	A033		FPS
100	00:00:04	12:30:28	55.49468	-15.82727	12	30	28			25

$$f_x = \lfloor 1 + D3/500 \rfloor$$

C	D	E
Layers	Frame	VideoTime
1	0	00:00:00
=1+D3/500	25	00:00:01
1.15	50	00:00:02
1.2	75	00:00:03
	100	00:00:04

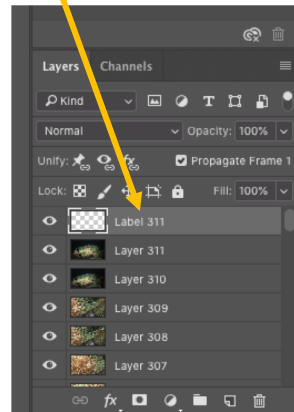
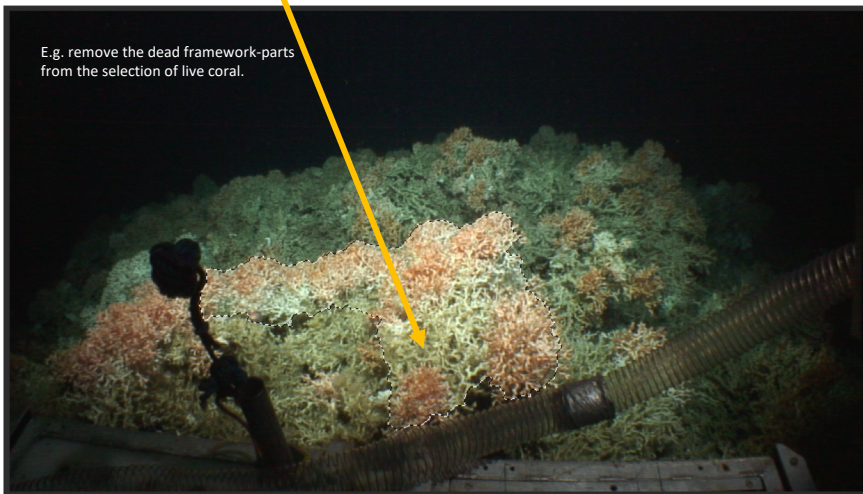
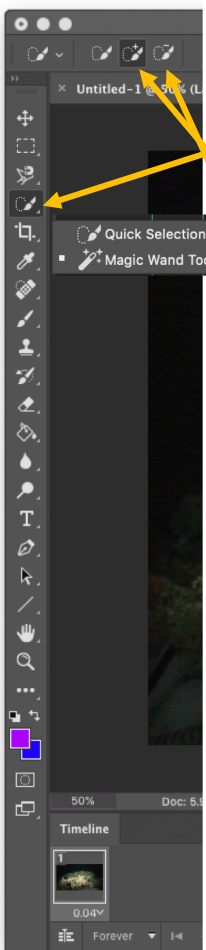
=E2+(SECOND(F3-F2)+60*MINUTE(F3-F2)+3600*HOUR(F3-F2))/10						
D	E	F	G	H	I	
Frame	Layers	VideoTime	SourceTime	Lon	Lat	h
0	1	00:00:00	12:30:24	55.49468	-15.82725	
25	F2)/10	00:00:01	12:30:25	55.49469	-15.82726	
50	1.20	00:00:02	12:30:26	55.49468	-15.82726	
75	1.30	00:00:03	12:30:27	55.49468	-15.82726	
100	1.40	00:00:04	12:30:28	55.49468	-15.82727	
125	1.50	00:00:05	12:30:29	55.49468	-15.82727	
150	1.60	00:00:06	12:30:30	55.49467	-15.82726	
175	1.70	00:00:07	12:30:31	55.49467	-15.82726	
200	1.80	00:00:08	12:30:32	55.49468	-15.82729	
225	1.90	00:00:09	12:30:33	55.49468	-15.82732	
250	2.00	00:00:10	12:30:34	55.49467	-15.8273	
275	2.10	00:00:11	12:30:35	55.49465	-15.82728	

## Section 4: Annotate images

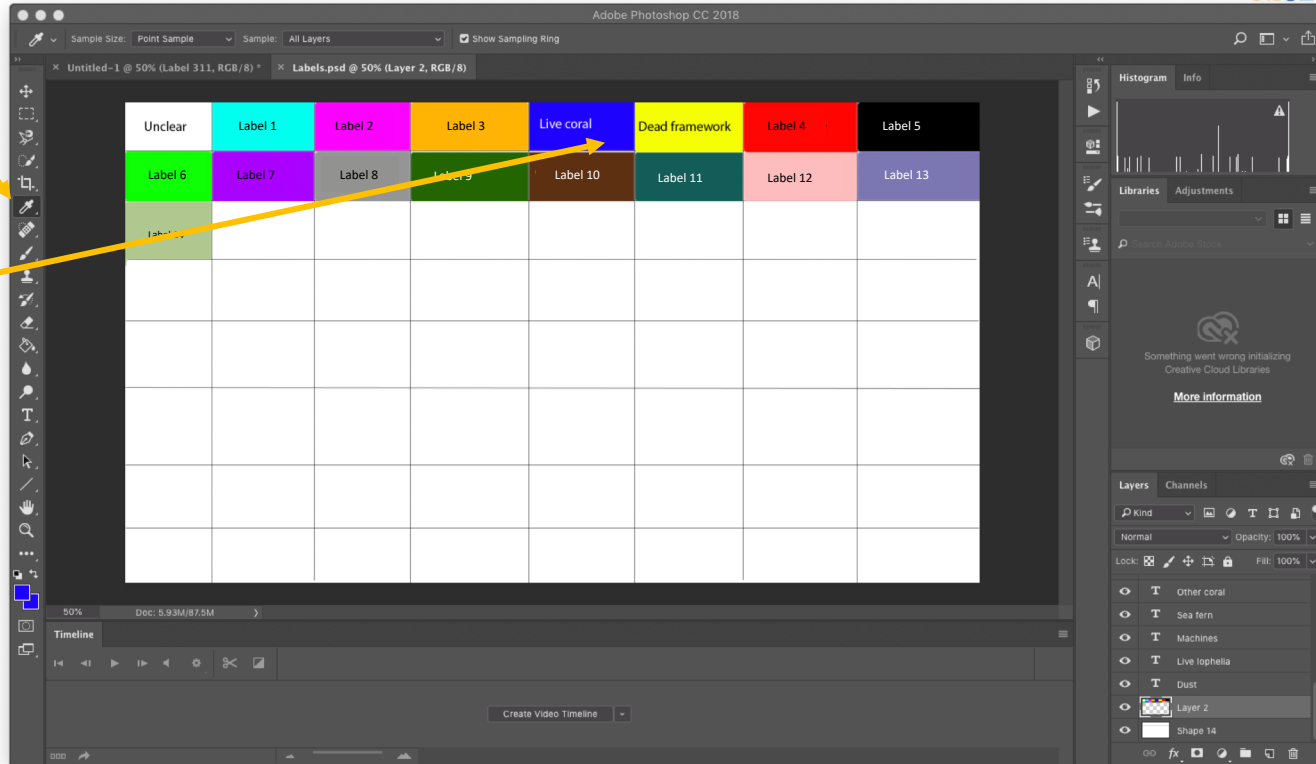
The extracted video frames appear as layers in your Photoshop file. To annotate an image, create a new layer above the image that you want to annotate. This layer will be transparent. So now you can label 'on' your original image and still be able to save the labelled image separately. Give it a name that links the labelled image to the original, e.g. if you want to label Layer 311 name your new layer 'Layer 311\_labelled'.

Here, we will show you how you can annotate these images in Photoshop.

1. Make sure you have selected the Label-layer of interest when you start to label.
2. Use the Quick Selection Tool or Magic Wand Tool to select the parts of the image you want to label.
3. Drag your mouse over the species/category you want to label. Make sure to select the button that makes you add to your selection.
4. If your selection is larger then preferred you can also select the button that makes you delete from your selection.



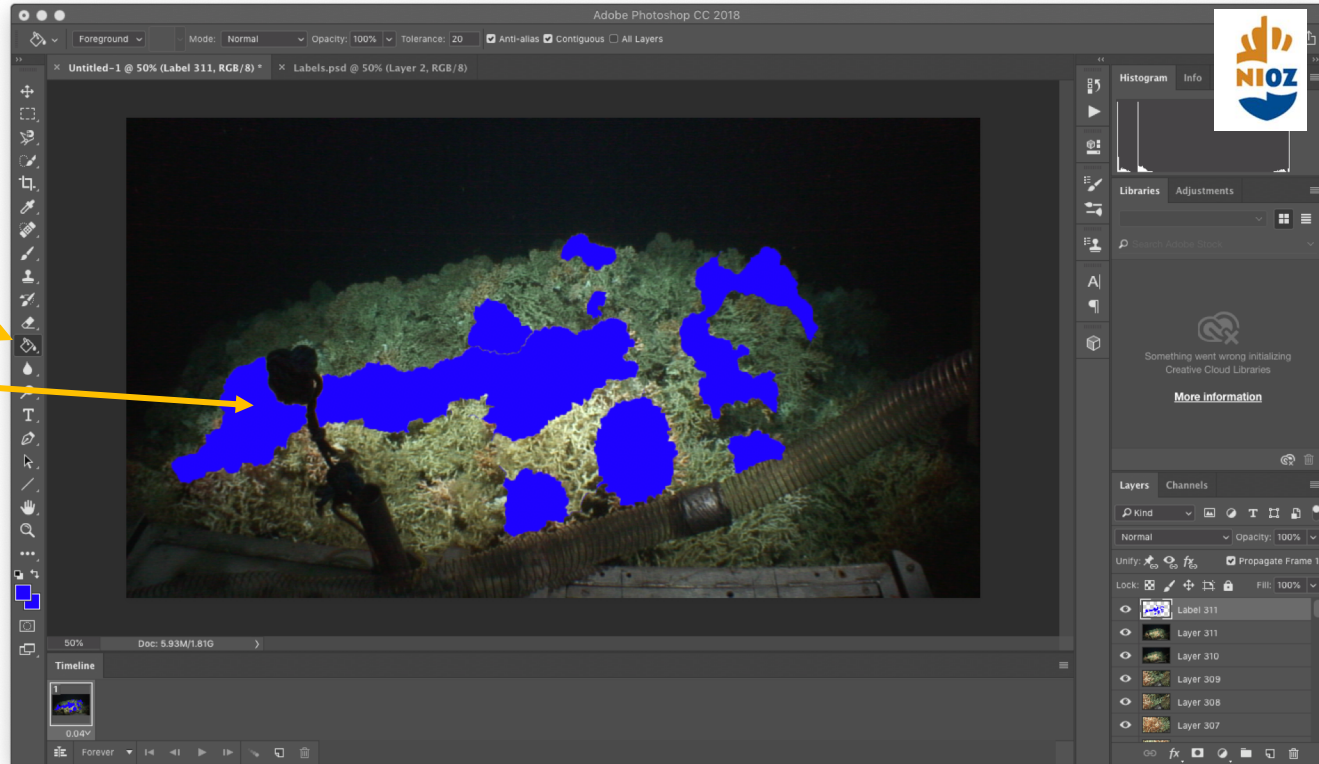
5. Select the Eye-dropper Tool and then select the correct colour from your labels.





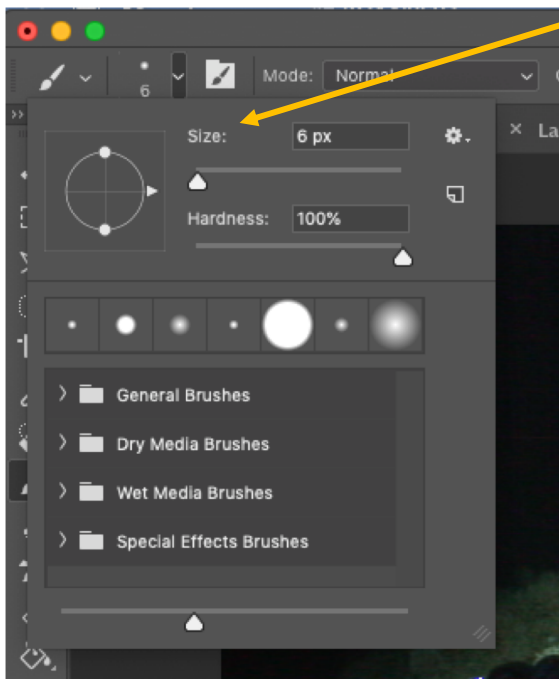
6. If you have the right colour selected, select the Paint Bucket Tool

7. Then click in the selected area to colour in the whole region



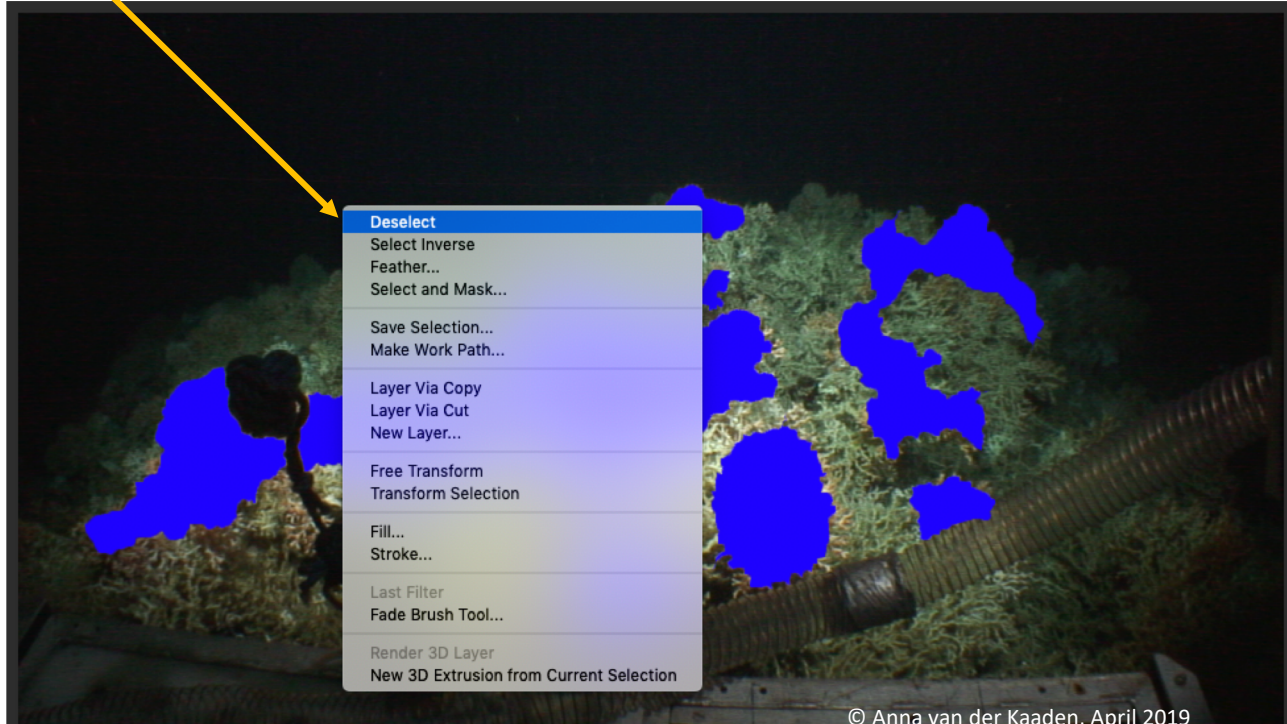
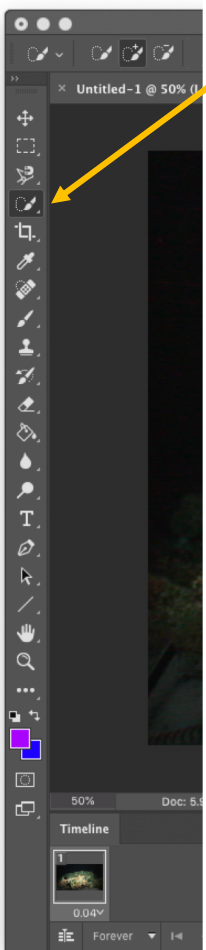


8. You can make small additions with the Brush Tool.  
Or remove small parts with the Eraser Tool  
Their size can be changed at the top.



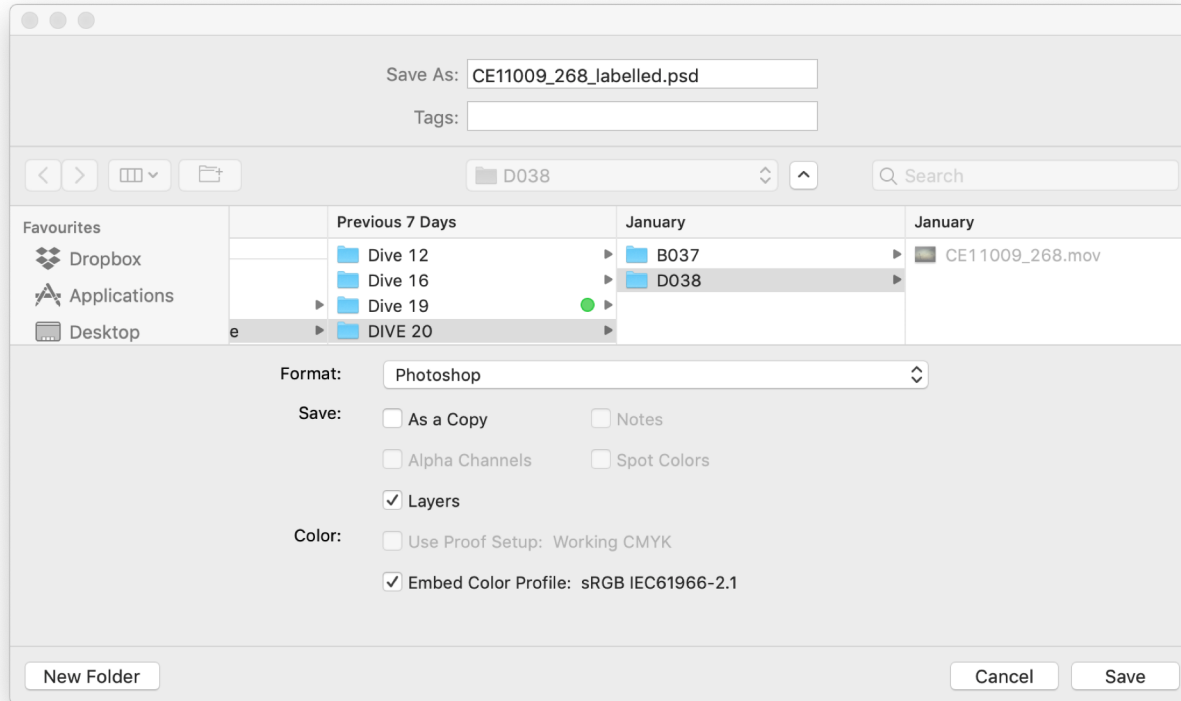
9. Select the Quick-Selection Tool again.

10. Right-click in the image to Deselect the selection.



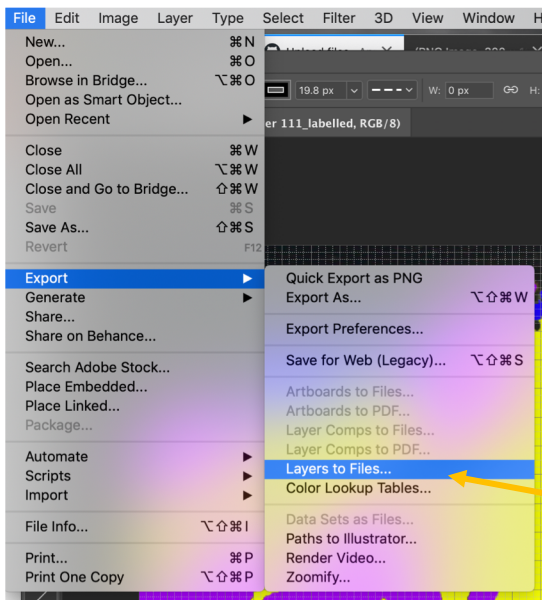
Now you can continue selecting other parts of the image.

When you're done save the file as the "[Name\_of\_video]\_labelled"



## Section 5: Export labelled images

Here, we show you how to quickly export only the annotated images (with their original if you want).



1. When you're done, make all annotated layers (and their corresponding original) visible, by clicking on the eye-icon next to the layer.

2. Go to File → Export → Layers to Files...

3. And choose "Visible Layers Only"

