



# Exercises with L3 time series: anomalies, EOF/PC

*wam\_anomaly*, *wam\_eof*, *wam\_overlay*

Creating anomalies, monthly means, EOF/PC

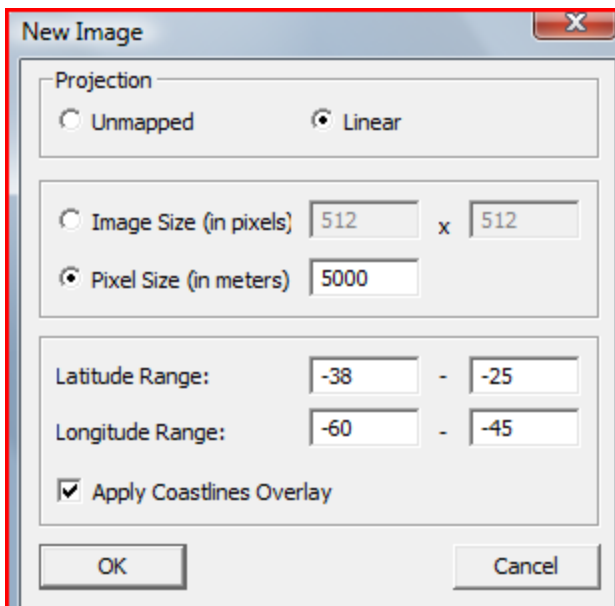
- See `\Course\3\Exercises_Anomalies_EOF_PC.pdf`
- Make a new folder for the project, e.g. `C:\Sat\Garcia`
- Create a **target map** with annotation
- Create a series of images remapped to your map
- Calculate **mean annual cycle** and **anomalies** with *wam\_anomaly*  
*wam\_anomaly* is an effective way to calculate the mean annual cycle and anomalies with a single command.  
With *wam\_overlay* you can easily annotate a set of monthly images.
- Create **EOFs** and **PCs** for your area of interest with *wam\_eof*  
With *wam\_overlay* you can easily annotate the set of PC images



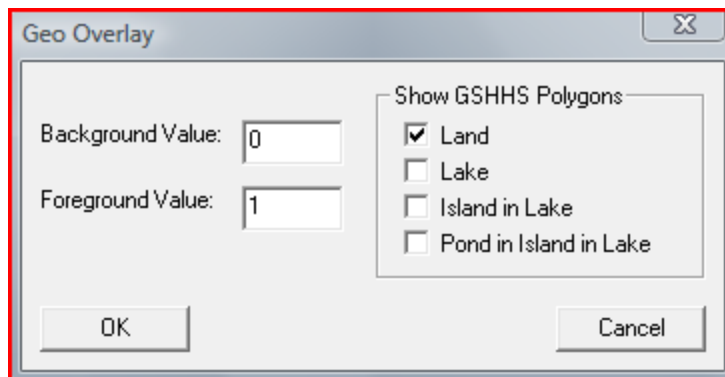


• Create a target map, save as C:\Sat\garcia\_5km\_chl\_48\_220.hdf

1.

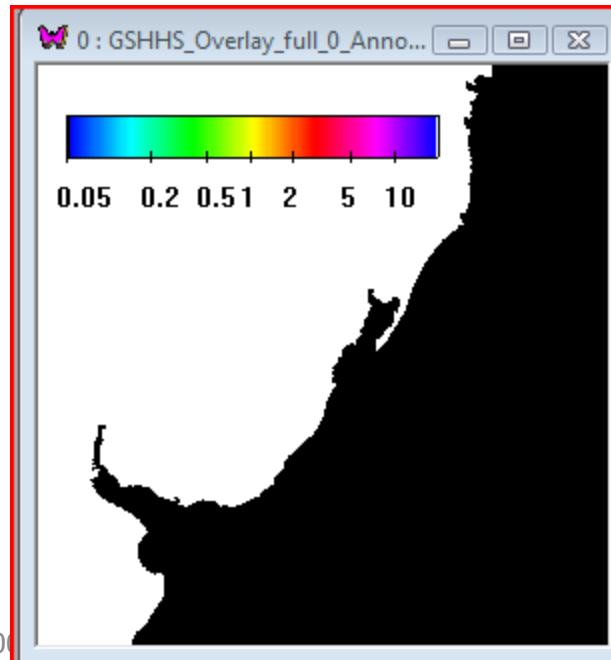
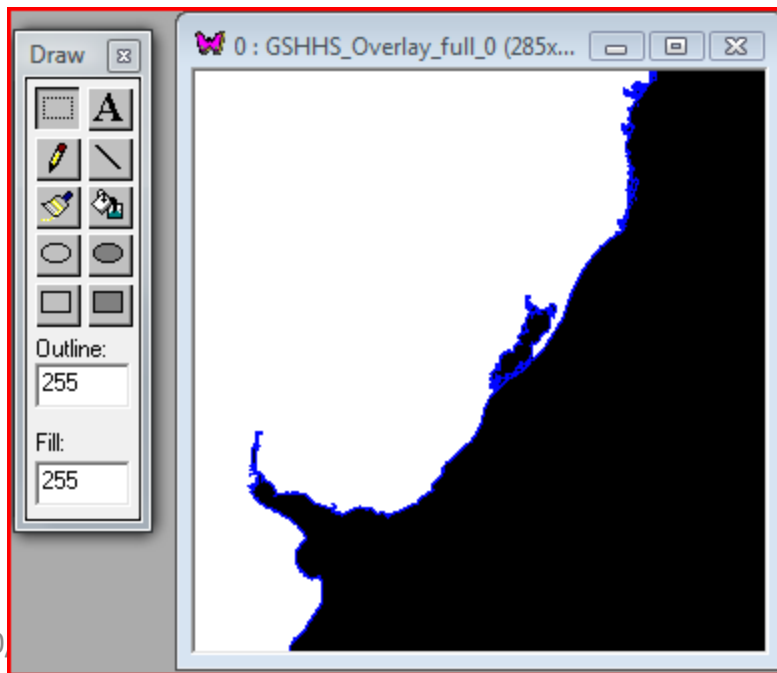


2. Geo-Get Map Overlay - coast\_full.b



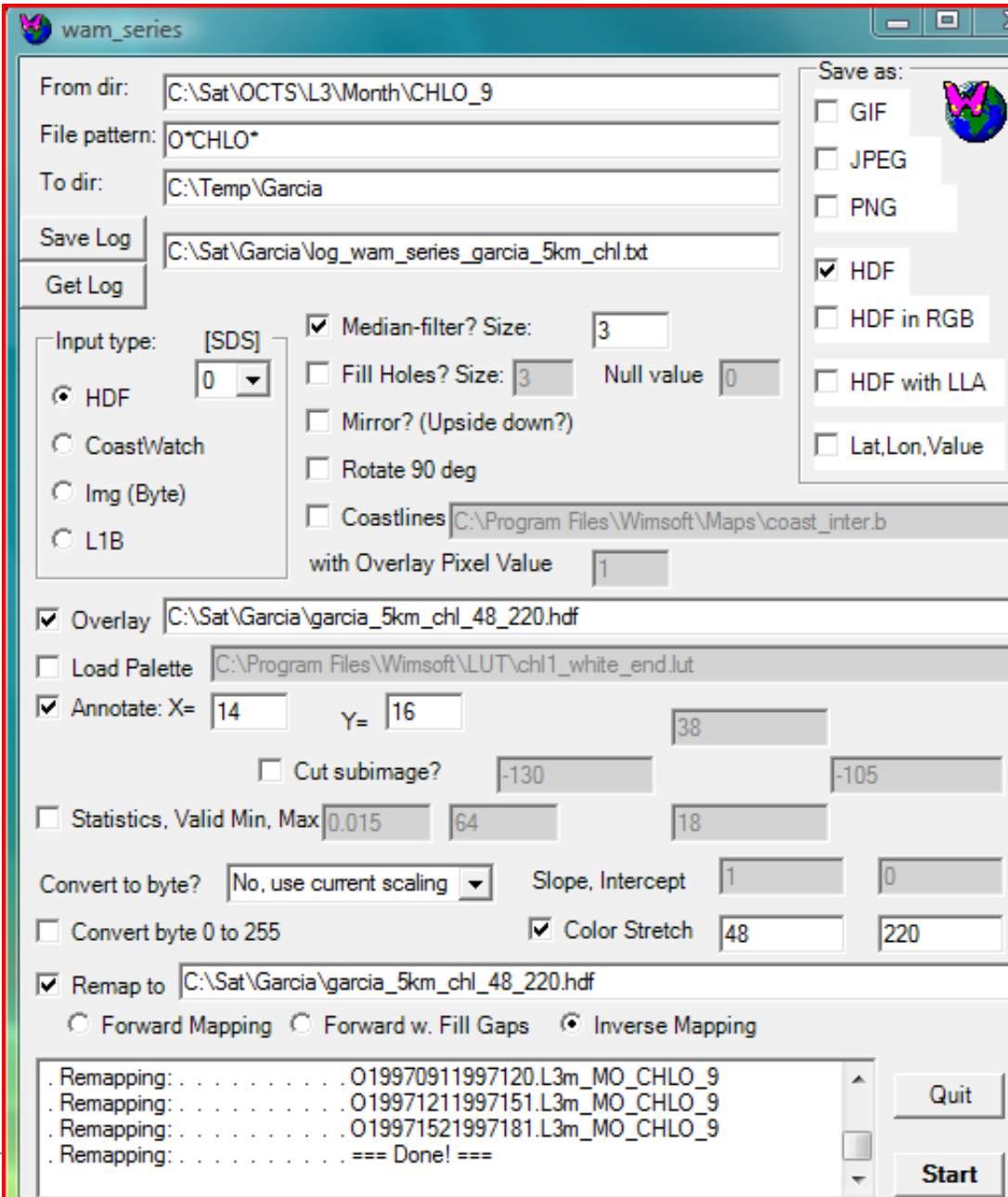
4. Set Scaling to Log-Chl, stretch colors to 48-220; View-Annotate

3.





- Remap monthly images to target map with *wam\_series*



use

- *Sat\OCTS\L3\Month\CHLO\_9*

and

- *Sat\SeaWiFS\L3\Month\CHLO\_9* (replace O\*CHLO\* with S\*CHLO\*)

- Move files to C:\Sat\Garcia\Chlo

- Save as PNG if you want to visualize time series

- Use/create folders:

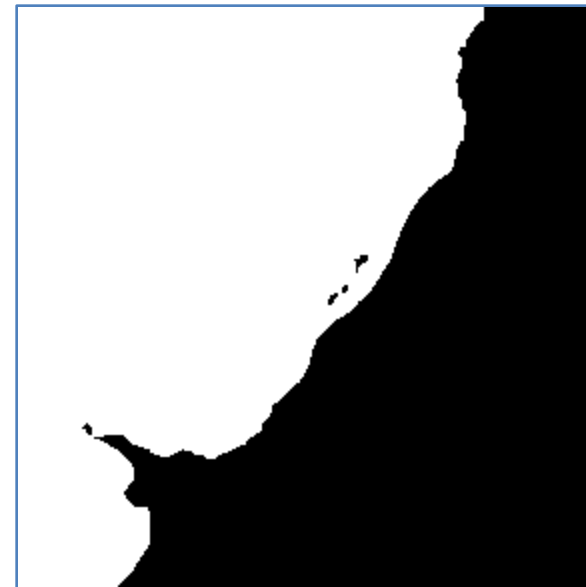
```
C:\Sat\Garcia
  chlo
  chlo_anomaly
  chlo_means
  chlo_eof
```





- Create “land mask” and “sea mask”

Save as *land\_mask.hdf*  
in *C:\Sat\Garcia*



Transf-Replace 1 with 255

Edge-Dilate-2x

Replace 0 with 1 and 255 with 0, save as  
*sea\_mask.hdf* in *C:\Sat\Garcia*





- Open cmd, ***cd C:\Sat\Garcia***
- ***wam\_anomaly chlo\\*.hdf 12 anomaly5.lut false land\_mask.hdf no 14 16***
  
- To understand the command syntax you can run ***wam\_anomaly*** without arguments.
- We use **12** to create monthly anomalies (i.e. 12 months), LUT file ***anomaly5.lut***, ***false*** means that we will create missing data as no anomaly. We use ***lands\_mask.hdf*** as our land mask and put annotation at x=14 and y=16.
- Move all the ***\*anomaly.\**** files into a separate folder ***chlo\_anomaly*** at the same level (not under *chlo*).



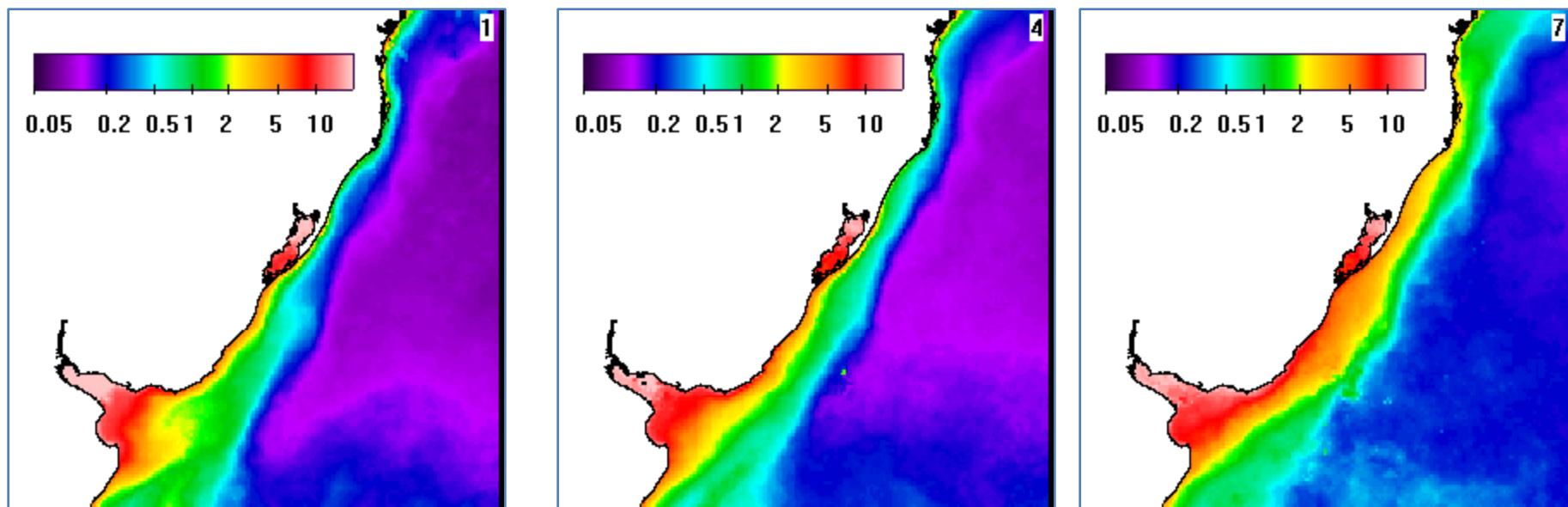


- Open cmd, *cd C:\Sat\Garcia*
- ***wam\_anomaly chlo\\*.hdf 12 anomaly5.lut false land\_mask.hdf no 14 16***
- To understand the command syntax you can run *wam\_anomaly* without arguments.
- We use 12 to create monthly anomalies (i.e. 12 months), LUT file *anomaly5.lut*, *false* means that we will create missing data as no anomaly. We use *lands\_mask.hdf* as our land mask and put annotation at x=14 and y=16.
- Sort by time and move all the *\*anomaly.\** files into a separate folder *chlo\_anomaly* at the same level (not under *chlo*).
- Note that the Chl anomalies are **ratios** (actual/mean); e.g. anomaly 2.0 means 2 times the mean, 0.5 means half of the mean
- Move *\*Means\** and *\*ValidCounts\** to *chlo\_means* and rename to *Means.hdf* and *ValidCounts.hdf*, respectively





- `wam_overlay chlo_means\Means.hdf`  
`garcia_5km_chl_48_220.hdf chl1_white_end.lut 48 220`
- This creates 12 annotated monthly mean images like



- You can visualize these with *Babarosa GIF Animator*





***wam\_eof chlo\_anomaly\\*anomaly.hdf sea\_mask.hdf***

- After the command finishes, you will have 3 new files:
  - *PC\_\_anomaly.hdf.hdf*
  - *\_anomaly.hdf\_Eigenvalues.csv*
  - *\_anomaly.hdf\_Eigenvectors.csv*
- Create a new folder ***C:\Sat\Garcia\chlo\_eof*** and move these 3 files there.

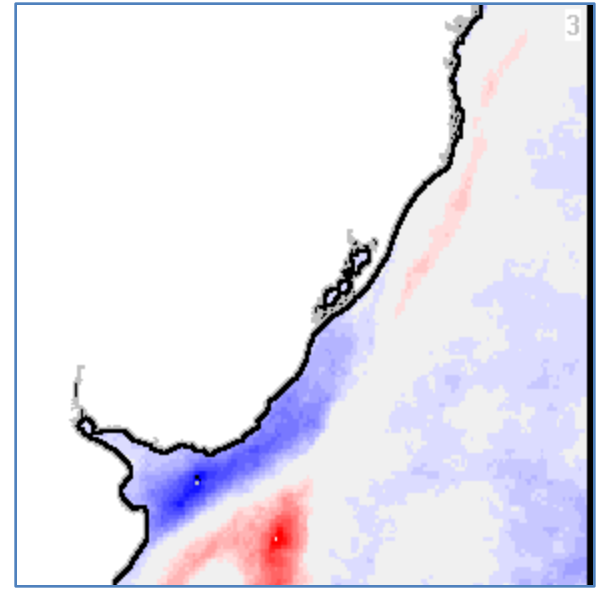
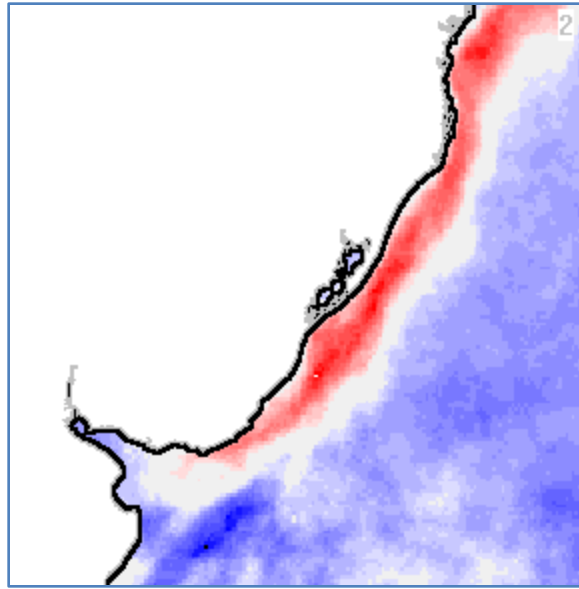
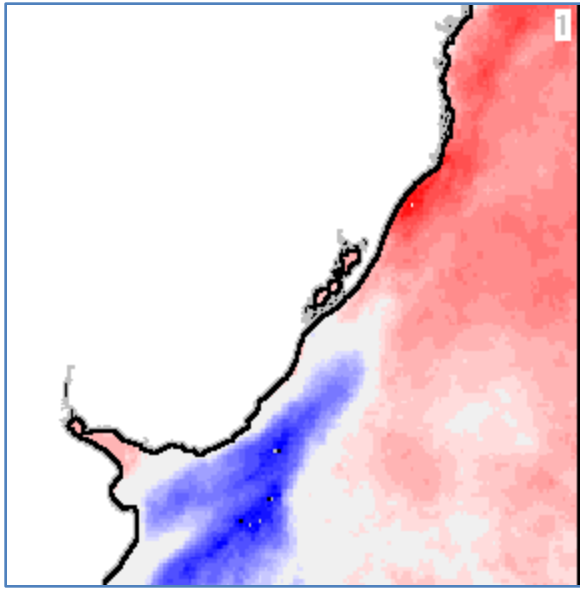
- Annotate all PC images with the *wam\_overlay* command:

***wam\_overlay chlo\_eof\PC\_\_anomaly.hdf.hdf  
garcia\_5km\_land.hdf anomaly5.lut*** (ALL IN 1 LINE!)





- PC images:



- the \**Eigenvalues.csv* file:

#	Mean	SD	EVal	EVal%	EvalCum%
1	108.093	21.497	17.813	13.5	13.5
2	107.061	19.191	12.177	9.2	22.7
3	113.745	14.397	9.094	6.9	29.6





- \**EigenVectors.csv* , make plots with Excel:

