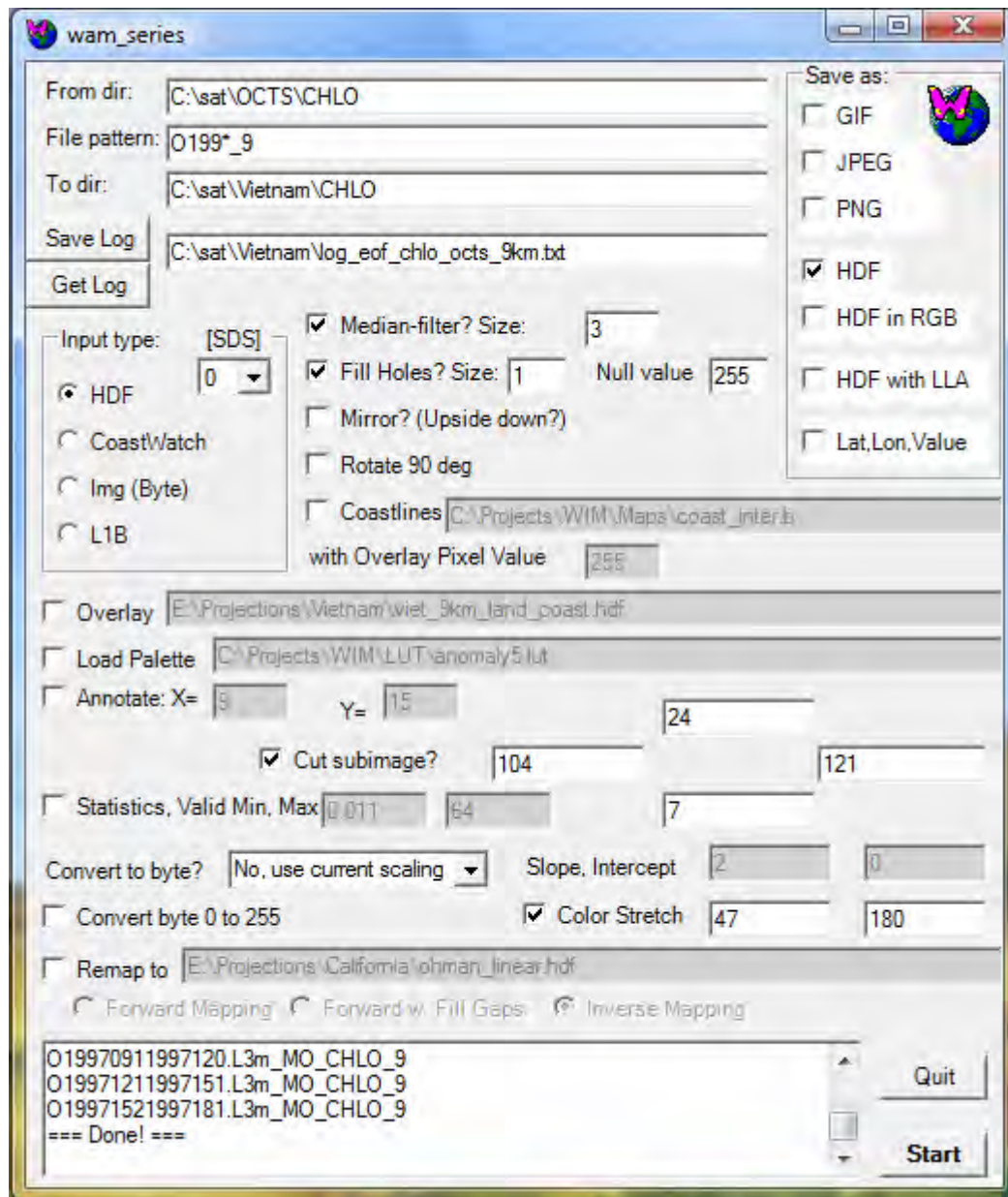


# EOF (Empirical Orthogonal Function) and PCA (Principal Component) analysis with WAM

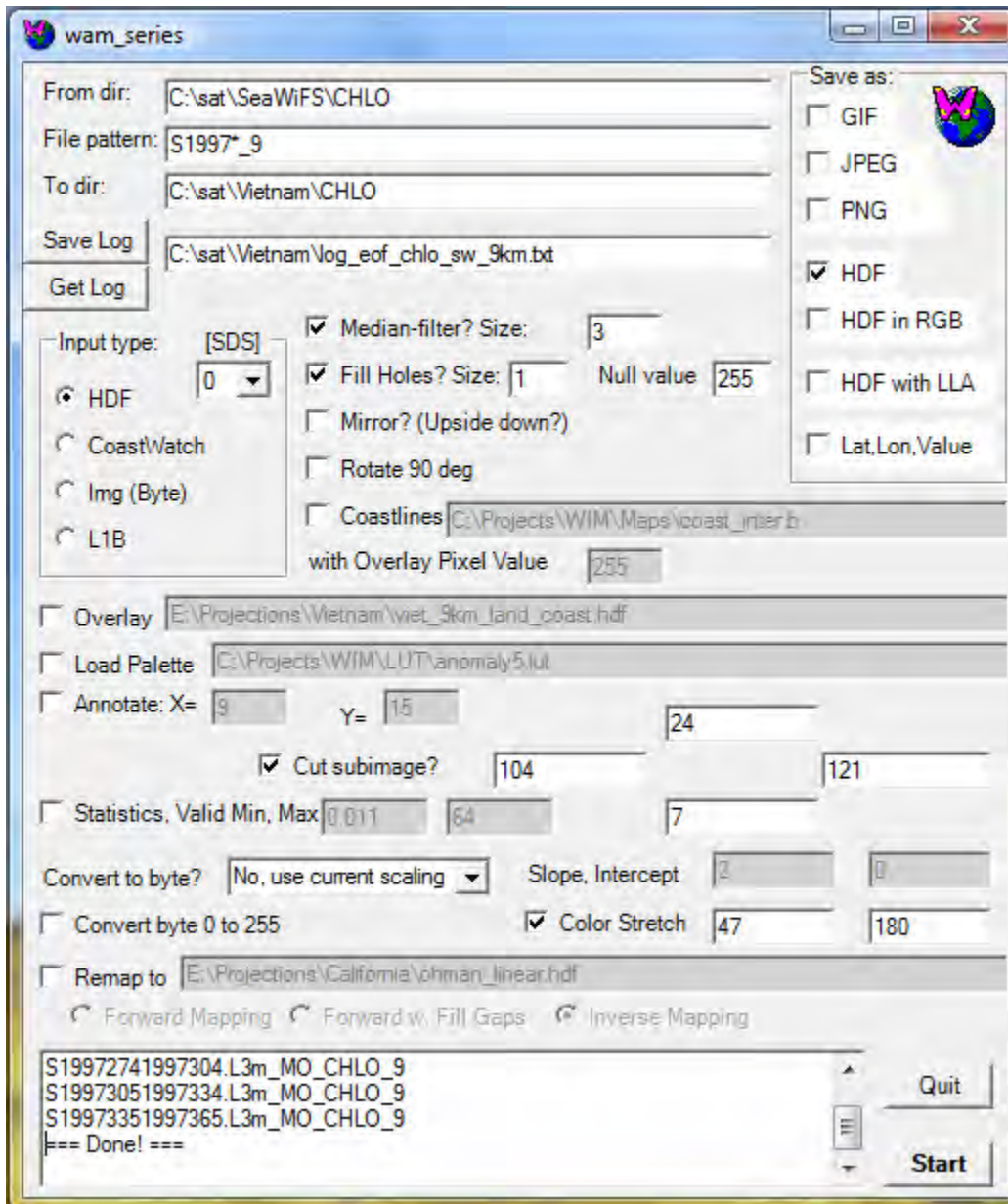
## 1 Appendix - Application to South China Sea

1. Using *wam\_series* cut out subsets for the range 7-24 ° latitude and 104-121 ° longitude.  
Create a directory CHLO, move the created Cut files there.

a) OCTS Level-3 monthly data



## b) SeaWiFS Level-3 monthly data



## 2. Create maps

- Using one of the cut HDF images create coastlines with WIM (*Geo-Get Overlay-coast\_full.b - background=0, foreground=255, land checked*)
- Fill land with pixel value 255 using *Edit-Draw-Fill*. Be careful with spilling of the masked pixels to outside of the contours. You can fill leaking areas with *Edit-Draw* brush. Save as *viet\_9km\_land.hdf*.



- Create land mask with coastlines: create coastlines with pixel value 1, overlay on top of *viet\_9km\_land\_coast.hdf*.
- Create dilated land-mask: use *Edge-Dilate-1* on *viet\_9km\_land.hdf*, save as *viet\_9km\_land\_dilated.hdf*.
- Create sea-mask: use *viet\_9km\_land\_dilated.hdf*, replace pixels 0 to 0 with 1 (*Transf-Replace Values*) and replace pixels 255 to 255 with 0. Save as *viet\_9km\_sea.hdf*.



3. Run *wam\_anomaly*; be careful to specify the location of your LUT file and *viet\_9km\_land\_dilated.hdf* file. It is easiest if you copy the LUT files *anomaly5.lut* and *chl1\_white\_end.lut* to your working directory.

```
wam_anomaly CHLO*.hdf 12 anomaly5.lut false viet_9km_land_dilated.hdf no 8 8
```

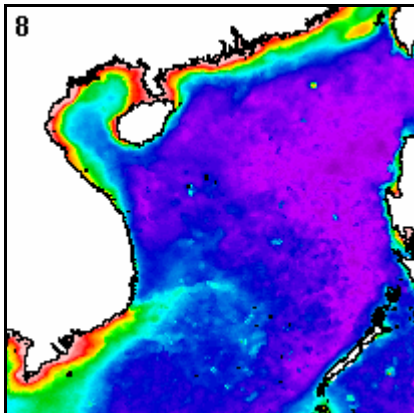
```

Administrator: C:\Windows\System32\cmd.exe
S20052442005273.L3m_MO_CHLO_9.Median.Fill.cut.hdf
S20052742005304.L3m_MO_CHLO_9.Median.Fill.cut.hdf
S20053052005334.L3m_MO_CHLO_9.Median.Fill.cut.hdf
S20053352005365.L3m_MO_CHLO_9.Median.Fill.cut.hdf
S20060012006031.L3m_MO_CHLO_9.Median.Fill.cut.hdf
S20060322006059.L3m_MO_CHLO_9.Median.Fill.cut.hdf
S20060602006090.L3m_MO_CHLO_9.Median.Fill.cut.hdf
S20060912006120.L3m_MO_CHLO_9.Median.Fill.cut.hdf
S20061212006151.L3m_MO_CHLO_9.Median.Fill.cut.hdf
S20061522006181.L3m_MO_CHLO_9.Median.Fill.cut.hdf
S20061822006212.L3m_MO_CHLO_9.Median.Fill.cut.hdf
S20062132006243.L3m_MO_CHLO_9.Median.Fill.cut.hdf
S20062442006273.L3m_MO_CHLO_9.Median.Fill.cut.hdf
S20062742006304.L3m_MO_CHLO_9.Median.Fill.cut.hdf
S20063052006334.L3m_MO_CHLO_9.Median.Fill.cut.hdf
S20063352006365.L3m_MO_CHLO_9.Median.Fill.cut.hdf
S20070012007031.L3m_MO_CHLO_9.Median.Fill.cut.hdf
S20070322007059.L3m_MO_CHLO_9.Median.Fill.cut.hdf
S20070602007090.L3m_MO_CHLO_9.Median.Fill.cut.hdf
Done with 123 images!

C:\sat\Vietnam>_

```

4. Create directory CHLO\_Anomaly, move all anomaly files there
5. Rename *Means* and *ValidCounts* filenames
6. Make directory *CHLO\_Means*, move *Means.hdf* and *ValidCounts.hdf* there.
7. Create annotated and overlaid monthly mean images  
wam\_overlay CHLO\_Means\Means.hdf viet\_9km\_land\_coast.hdf chl1\_white\_end.lut  
August (month 8) image is shown below.



8. Run wam\_eof  
wam\_eof CHLO\_Anomaly\\*anomaly.hdf viet\_9km\_sea.hdf
9. Rename Eigenvalues.csv, Eigenvectors.csv, PC\_anomaly.hdf; create a directory CHLO\_EOF, move these files there
10. Create annotated and overlaid PC images  
wam\_overlay CHLO\_EOF\PC\_anomaly.hdf viet\_9km\_land\_coast.hdf anomaly5.lut 1 255

Principal components 1 and 5 are shown below.

