



Time series of L3 satellite data

- See `\Course\3\3_time_series_of_satellite_images_lecture.pdf` for an introduction

- **L3 data** are most appropriate for time series analysis: uniformly binned in space and time (composited), mapped, quality controlled

Level 3 = Binned in space (gridded) and time (composited), typical are **SMI** (Standard Mapped Image) mapped to global Equidistant Cylindrical projection

- Find some L3 data series, e.g. CHL_9, SST, SLA
- 1. Make **movie loops** (animated GIFs) with `wam_series`
- 2. Make your own composites, e.g. *Monthly* from *Daily*
- 3. Create time series of **statistics** with `wam_statist`
- 4. Create **anomalies**, **monthly means**, **EOF/PC** with `wam_anomaly`, `wam_eof` and `wam_overlay`





Exercises with L3 time series

- **Need input data, e.g.**

`\Sat\SeaWiFS\L3\Monthly\CHL_9` from the DVD or copied to
`C:\Sat\SeaWiFS\L3\Monthly\CHL_9`

- You can add OCTS data from `\Sat\OCTS\L3\Monthly\CHL_9` to the same folder for convenience

- The same datasets can be downloaded from

- <http://oceandata.sci.gsfc.nasa.gov>

- After downloading, uncompress with `bzip2 -d *.bz2` and compress with `wam_compress_hdf`

- Make new directories for each output type, e.g. `C:\sat\TMP` for temporary output or pick a more appropriate name for output; **don't keep the modified files in the original data folder!**

- Pick your **area of interest**, e.g. Sea of Japan, Central America. Note the latitude-longitude range and create a **Linear** projection file for your area (with **File-New** in WIM).





Exercises with L3 time series

1) Using *wam_series*

- Check out exercise 4.1 on *wam_series* in *Course\1\Exercises_WIM_WAM.pdf* or *WAM.pdf*
- See [3 Time series of L3 satellite data movie.pdf](#)

- First test with a few matching images! Match a single or a few images! Don't run a test with ALL images at once as that will take a long time and you cannot stop the processing!





Exercises with L3 time series

Making movie loops (animated GIFs)

- Make a series of JPEGs or PNGs of your area you with *wam_series*.
- Install *Babarosa GIF Animator* (run *babarosa.exe* in the **tools** folder on the DVD) or another program for creating animations. Create an animated GIF with *Babarosa GIF Animator*, save as *GIF*.
- View the animation, e.g with the *Windows Picture and Fax Viewer* or *Internet Explorer* (drag the GIF into the browser).

- Do exercises *Creating a Chl-a movie for South China Sea* and *Exercises using sea level height data* (see <http://Wimsoft.com/Manual> but **for your area of interest!**)





Exercises with L3 time series

2) Making monthly composites

- See *Course\3\Tutorial_Compositing.pdf* and *Course\3\Tutorial_Compositing.pdf*
- Need data in ***Sat\SeaWiFS\L3\Daily\CHL_9***
- Open command prompt and ***cd*** to the directory where you will create the output files, e.g.
- ***cd C:\Sat\SeaWiFS\L3\Daily***
- Type ***wam_composite_month*** to see available options
- Run
wam_composite_month CHL_9\S200*.hdf count





Exercises with L3 time series

3) Using *wam_statist*

Creating time series of statistics with *wam_statist*

1. Create a mask image of your area of interest – see exercise 4.3 for *wam_statist* in *Exercises_WIM_WAM.pdf*.
2. Create a **list of images** with ***dir /b /s *.hdf > list.txt***
3. Run ***wam_statist***
4. Sort your masked areas (if more than 1) with ***sortmasks*** or in *MS Excel*
5. Create plots with *MS Excel*; use *mean* or *median* versus time: create a new time column, e.g. as $SYear + (Sday+15)/365$





Exercises with L3 time series

4) Using *wam_anomaly*, *wam_eof* and *wam_overlay*

Creating anomalies, monthly means, EOF/PC

- See `\Course\3\Exercises_WAM_EOF.pdf` and `\Course\3\3_Exercises_WAM_EOF_Appendix_South_China_Sea.pdf`
- Create a target map, remap monthly images to that map
- Try to reproduce EOF/PCA analysis for your area of interest. The first part of the analysis is the calculation of the mean annual cycle and the anomalies. *wam_anomaly* is a simple way to calculate the mean annual cycle by creating monthly means for all 12 months with a single command.
- With *wam_overlay* you can easily annotate a set of monthly images.

