



## Questions & Answers Session 3

Please type your questions in the Question Box. We will try our best to get to all your questions. If we don't, feel free to email Sherry Palacios ([sherry.palacios@gmail.com](mailto:sherry.palacios@gmail.com)) or Amita Mehta ([amita.v.mehta@nasa.gov](mailto:amita.v.mehta@nasa.gov))

### Question 1:

I Prepare a new text file: WQ\_Insitu2015.txt using data from WQ\_Insitu2015.xlsx and WQ\_Insitu2014.txt as a template. What does it mean "Write down the units of chlorophyll-a"? This is not the last column at the right of the xls file?

**Answer 1:** We think the questioner is asking: What are the units of chlorophyll-a in in situ data file (in WQ\_Insitu2015.xlsx)?

Units for chlorophyll concentration should be either micrograms/L or milligrams/m<sup>3</sup>  
>> This means the same thing, it is just adjusted for which units are being used (think back to Introduction to Chemistry class converting across scale)

**Question 2:** What value of R<sup>2</sup> is acceptable? (question asked while Amita was presenting the correlative plot)

**Answer 2:** R<sup>2</sup> significance depends on the number of (independent) data samples used in the calculation. There are standard statistical significance tests (e.g. T-Test) that give you the confidence value (in percent) for the correlation coefficient. In our example we have so few points that we can not use such a small sample to assign significance.

**Question 3:** Is there a guideline for collecting in situ data for calibration and verification of algorithms? How would one collect samples that somehow compares to image pixel resolutions?

**Answer 3:** There is a large body of work on collecting in situ data for calibration and validation in the ocean optics community. The OceanColor Web website has documentation to help you with this answer, as it is involved. We point the questioner to the Technical Documents page (<https://oceancolor.gsfc.nasa.gov/docs/technical/>). This can be found by first navigating to the OceanColor Web main page, then Docs >> Technical Documents.



In situ comparison to image - pixel box size. Look for Wes Moses paper. Generally, average a 3 x 3 pixel box around the ground truth station location. This helps account for boat drift too. This number/box size is not set in stone, it should be evaluated. Wes Moses' paper can provide insight. Sherry to research further.

Moses, W. J., S. G. Ackleson, J. W. Hair, C. A. Hostetler, and W. D. Miller (2016), Spatial scales of optical variability in the coastal ocean: Implications for remote sensing and in situ sampling, *J. Geophys. Res. Oceans*, 121, 4194–4208, [doi:10.1002/2016JC011767](https://doi.org/10.1002/2016JC011767).

**Question 4:** How do you make the in situ text file? Manually?

**Answer 4:** Yes manually. It is also possible to set up scripts in Matlab or Python, or whichever data handling scripting language you prefer, to automate making these files. If you do that, pay extra attention to the physical formatting of spaces and commas in the file and test your code to be sure it is producing the formatting correctly.

**Question 6:** (SeaDAS question) Why might the crop command be greyed out?

**Answer 6:** The crop tool will not work unless the raster is loaded into the viewer.

**Question 7:** Why might you want to use the BEAM dimap format instead of TIFF or img?

**Answer 7:** For our purposes, we are using that format because we are doing this work in SeaDAS. If you wanted to make your image file more portable to use in QGIS or ArcGIS, then exporting to TIFF might be more appropriate.

**Question 8:** Are there any other open source software available similar to SeaDAS?

**Answer 8:** SNAP (<https://step.esa.int/main/toolboxes/snap/>) is used for the Sentinel series of sensors. It has a similar user interface to SeaDAS and is developed by the same consulting firm that created the version of SeaDAS you are working with today.

Prior to 2013, SeaDAS had a much different user interface. For limited image processing, but excellent GIS capability, we point the questioner to QGIS

(<https://qgis.org/en/site/>). A number of ARSET trainings have used QGIS.

Sherry & Amita - find some links for ARSET trainings that use QGIS (not water quality - other areas)

<https://arset.gsfc.nasa.gov/water/webinars/2019-river-basin>



From Dr. Gurlin: They have video tutorials for the installation of the ESA SNAP software and the installation and integration of different processors (e.g. Sen2Cor). They're still helpful even though they're a little outdated at this point in time. I think, in terms of SeaDAS, a lot of people on Windows operating systems have trouble setting up the required Linux server for the OCSSW processors which is probably too complicated to show in a tutorial. I think to show the setup on a Linux operating system itself is within the realm of possibilities though. Linux operating systems are free, easy to install, and possible to install as a second operating system which might make them more accessible.

**Question 10:** SeaDAS issues with processing Landsat.

**Answer 10:** Be sure to always use the most up to date version of SeaDAS if you are going to be working with Landsat data. If you have trouble with the OCSSW processors, as some have had in this series, sometimes re-installing the OCSSW processors (from the menu bar) just for OLI with a clean install can help. If that does not work, sometimes uninstalling and then re-installing SeaDAS can help. Also, be sure that you are using the correct Landsat 8 OLI/TIRS C1 Level-1 data downloaded from the EarthExplorer website.

[https://seadas.gsfc.nasa.gov/tutorials/installation\\_tutorial/](https://seadas.gsfc.nasa.gov/tutorials/installation_tutorial/)

[https://oceancolor.gsfc.nasa.gov/forum/oceancolor/forum\\_show.pl](https://oceancolor.gsfc.nasa.gov/forum/oceancolor/forum_show.pl)

**Question 11:** When you were doing the mosaic, why did the lower image seem skew or stretched? Should one be correcting for some angle or any other data?

**Answer 11:** When doing the mosaic, both of the input files have been projected using the same coordinate system. One of the images is from a very high latitude and that may be why it appears strongly skewed.

**Question 12:** Hi, for in-situ correlations and regressions with satellite values, what is the best way to do multiple days of in-situ data? Is there a specific export feature for that?

**Answer 12:** For in situ data you can add date in the /field parameter and add additional days data in the data section of the file. We will check if/how one can use SeaDAS GUI to do regression analysis across multiple days and let you know. But you can use SeaDAS for extracting pixel values around the in situ data from different days/images and do off-line comparison (e.g. in Excel).



**Question 13:** Do we have to send you the data that we processed during the course, in order to get the certificate? Or just complete homework 1 and 3, provided in the Google forms?

**Answer 13:** You do not need to send in the data. Just answer the questions in the Google Forms for Part 1 and Part 3. New due date July 5th.

**Question 14:** Is there a character number limit in the length of the name of path+file in seadas? Are space characters, underscore, or dash ("-") accepted? I have installed a virtual machine with ubuntu and SeaDAS on it (but there are some problems to solve with python, for example...

**Answer 14:** It is recommended that you not use spaces in the name of path+file. Underscores and dashes should be fine. Previous versions of SeaDAS (pre-2013) had a character number limit, but so far in our usage, we have not encountered a character number limit for the path/filename. We encourage the questioner to review the link noted in Question 10 above for the installation instructions and the dependencies for installation for the problems related to Python.

**Question 15:** I'm on page number 7 of the Advanced Skills with SeaDAS document. Could we choose another reference file?

**Answer 15:** Yes. This exercise is just to give you an idea of the functionality. You can choose another file as the reference file. You can also change the output file name, the naming of the target file bands to something you prefer. Much of this is customizable. We chose to use many of the default values for the exercise.

**Question 16:** Hi, would in-situ validation of index values (e.g., the color index or the cyano index) be validated in the same way (correlation/regression) as these demonstrations? Please comment on that, thank you.

**Answer 16:** If Level-2 data include these parameters (in OCSSW please check geophysical output selection) then you can use this feature. But I don't think cyano index is part of the L-2 data. Another way would be to use SeaDAS for extracting band reflectance pixels around in situ measurements and do your own regression analysis.

**Question 17:** Is there any way to make a year's average MODIS SST contour graph in SeaDas from separate .nc files? Or should I make a new .nc file with the average value in the cells of interest and then plot the contour graph?



**Answer 17:** This can be done in QGIS -- add rasters from different .nc files and do raster calculation to average them. Averaged data can be added as a raster and draw/display contours or color-filled map.

To perform a time series analysis in SeaDAS, we recommend the questioner review the SeaDAS Help section on time series

(<https://seadas.gsfc.nasa.gov/help/visat/index.html#TimeSeries>).

Also, a helpful SeaDAS video tutorial produced a few years ago walks through creating a SST anomaly using multiple images over time. The link to all of the video tutorials is found here ([https://seadas.gsfc.nasa.gov/tutorials/video\\_tutorials/](https://seadas.gsfc.nasa.gov/tutorials/video_tutorials/)). If you scroll down the page to the case study titled, "Sea Surface Temperature Anomalies", the website shows a breakdown by timestamp of the different skills covered to create this time series analysis to obtain the anomaly. In that section you will find the link to the video.

**Question 18:** Can you check the signals against some sort of spill on land? Its in terms of a spill of highly saline water on land and I would like to use the tools to check up on this.

**Answer 18:** Optical data (MODIS and Landsat) are used for detecting water on previously dry land. If the spill of saline water shows significant contrast in reflectance compared to dry land at that location then you may be able to detect the spill (please see <https://floodmap.modaps.eosdis.nasa.gov/proddesc.php> for documentation on how to detect water on previously dry land).

**Question 19:** About OCSSW there is a comment:

"LC08\_L1TP\_024030\_20150901\_20170225\_01\_T1\_MTL.txt image and i receive the same warning: file ... is not a valid input mission: Mission=null."

**Answer 19:** This might be related to an issue with a space in your path and/or file name. Check the file name. If that does not work, you may want to re-install OCSSW. Then restart SeaDAS. If this does not work you may have to re-install SeaDAS unfortunately!