

SUMMARY OF UPDATES TO OW TOOL, October 2008

More revisions have been made to the OW tool following the DMQC-3 Workshop in September 2008.

1. The October 2008 release of OW is now officially **Version 1.0**. The related manuscript was accepted by Deep-Sea Research in September 2008.

2. There was unanimous agreement from DMQC-3 that all temperature values in the float_source .mat files and in the reference database should be recorded in **ITS-90**. All users have agreed to download the ITS-90 version of the CSIRO SEAWATER library, and to convert TEMP in IPTS-68 in their old float_source .mat files back to ITS-90. All documentations in OW have been updated to reflect that temperature inputs in OW are now in ITS-90.

3. Based on more discussions with Paul Robbins, the 10 “best” levels used in the calibration have now been changed to the 10 float observed θ levels with the smallest salinity variance on θ . That is, none of the 10 “best” levels is a pressure level. Using all θ levels has the advantage of reducing the effect of water mass variability in the least squares fit. The overall trend of the fit from this new version should be the same as that from the previous version, but there will be fewer exotic breakpoints in this new version.

The old routine find_10floatdepths.m has therefore been deleted and replaced by a new routine called **find_10thetas.m**.

IMPORTANT NOTE: because of this revision to use all θ levels, the matrices PRES, SAL, TEMP, PTMP in the float_source .mat files no longer need to be aligned along the y-axis! The old aligned matrices will still work, but users no longer need to spend time doing this alignment step.

4. A new variable “use_percent_gt” has been added to the calseries_.mat file. This variable specifies that only float θ levels with percentage of valid measurements greater than this number will be included in the 10-theta selection. In the previous version of OW, this percentage was hidden in the codes during the 10-level selection. At the DMQC-3 Workshop, several users asked about changing this variable in the codes, and so I decided to bring it out as an explicit variable in the calseries_.mat file. The routine **set_calseries.m** now automatically sets **use_percent_gt = 0.5** (=50%). Users can either change this to whatever they want for each float in the respective calseries_.mat file, or they can change the global default value of 0.5 to whatever they want in set_calseries.m.

For example, the old U Washington floats sampled deep every 4th profile. Because I want to use these deep profiles in the calibration, I would set use_percent_gt = 0.25 (=25%) for these old U Washington floats.

5. The default value of 99999 for “use_theta_gt”, “use_theta_lt”, “use_pres_lt”, “use_pres_gt” continues to be a problem for users, because it is easy to miss a ‘9’ while users change the values of these 4 variables to refine the calibration range. Therefore set_calseries.m now sets the default value of these 4 variables to an empty matrix []. It is easy to recognize an empty matrix as the default, and one simply cannot make any mistakes when specifying an empty matrix!

5. The routine **plot_diagnostics_ow.m** has been modified to show the selected ten θ levels with the smallest salinity variance. The routine analyze_variance.m has been removed.

6. The routine **fit_cond.m** has been modified to deal with single profiles. That is, OW will now produce estimates for single profiles! Also, **anom.m** has been modified so that it won't bomb when there is only one profile.

7. Based on Virginie Thierry's suggestion, in the routine **find_besthist.m**, the selection of the initial ellipse now includes PV constraint if you specify MAP_USE_PV = 1.

8. Based on a bug identified by Justin Buck, Sallee's routine **frontalConstraintSAF.m** has been modified to deal with profiles with very few valid data points.

9. The name of the routine build_pwl_lvcov_ptmp.m has been simplified to **build_ptmp_cov.m**. The routine **calculate_piecewisefit.m** has been modified to take into account all relevant changes listed above.

10. The **README** file has been updated and is now in pdf format.

11. Please email awong@ocean.washington.edu and bowens@whoi.edu if you see any more bugs. Thank you.

---- Annie Wong, 7 October 2008