Carbon data were obtained from Dr. D. Ianson.

Addition of the data to CHE files was done by Germaine Gatien between November 2017 and May 2018.

The data were delivered in text file grl2016.raw and contained data from the following cruises:

2003-29

2010-36, -57, -73

2011-09, -10, -28, -60, -76

2012-04, -05, -06, -19, -57

The data included other bottle data that were already in the OSD Data Archive including salinity, DO, CHL and nutrient data.

The text file could not be opened in Excel, but with Ultraedit it was converted to a format (Debby3.txt) which could be opened in Excel. The data did not appear in consistent columns, but by using column editing In Ultraedit the data were lined up and saved as a CSV file. NOTE: It was discovered later that quality flags “2” were entered in the carbon data wherever there was no other flag entered. That should have been changed to 0 flags to suit the OSD Data archive but was not noted at the time. That was fixed in the CHE files in the final steps in the data processing.

The CSV file was opened in Excel, and a 6-line header was added. A column with the file name was created to serve as the file break column. The file was saved as Debby3-6linehdr.csv. That file was then converted to DIC files for each cast (containing DIC, Alkalinity and sometimes pH). Headedit was used to fix formats and change the channels names so that they were different from those in the CHE files (output: DICHDR files). This enabled a merge with data from both sources, so checks could be made that the matching of samples was being done correctly.

The CHE files from the relevant cruises were found, sorted on sample number and merged with the DICHDR files. The merged files were then exported to spreadsheet “debby-arhcive-combo-test.xlsx.” Differences were calculated for all channels that are repeated. The only discrepancies found were for nutrients for 2010-36. This was due to a correction that had been applied to the nutrients in the CHE files but not in the data in Debby’s files. This is of no concern since the corrections were considered important only for deep samples, and there were none in Debby’s data.

Having confirmed that the two sets of files were merged correctly, the merge was repeated WITHOUT choosing the repeat columns from Debby’s files. Output \*.MRG. Those files contain header comments that we want to augment with details about the carbon analysis techniques and additions to the reference list. The most efficient way to do that without losing important comments about individual samples that vary from one file to another is to remove the general comments and then add new ones prepared for each cruise. This removal step was completed by Di Wan.

The data were then separated into individual cruises as the next steps vary from one to another. There are only pH data for 3 cruises (2010-36, 2011-09 and 2011-10) and header comments need to be treated individually. A header text file was prepared for each cruise combining header comments from the original processing and those concerning the carbon data.

SORT was run on the merged files to arrange the data by increasing pressure.

CLEAN was then run to remove empty channels. This will remove the pH channel where there are no data in a file. This step was also used to change flags 2 to 0. As noted above, 2 flags were entered in the carbon spreadsheet whereas 0s are appropriate for the OSD archive. They were not assigned by the analyst and only mark the absence of any comments. Checks were made to ensure there were no valid 2 flags in the channels in the original files. The only cruises where that applied were from 2012 and there were only 8 files affected:

2012-04-0070

2012-05-0041

2012-05-0064

2012-05-0070

2012-05-0080

2012-06-0076

2012-19-0007

2012-57-0013

CLEAN was run a second time to add 0 flags to the added flag columns that have no quality flags.

Header comments were prepared for each cruise. Header Edit was then run to add the new header comments. A few issues arose and were dealt with in this process:

* The formats changed for flag channels between 2003 and 2010 with the change from width 2 to width 3 and some 2-digit flags got inadvertently clipped because of the wrong format used.
* There were some repeated comments in the headers. This arose because the order of header entries varied somewhat. A text editor was used to remove the repeated comments.

The missing flags were re-instated in the CHE files for the 8 cases mentioned above.

Standards Check was run. A few cases of non-standard formats were noted:

* The nutrient formats were not at the current standard, but that is because the standard has changed in recent years.
* For 2010-57 Depth:Nominal is non-standard. This choice was deliberate.
* The pH format is non-standard but only 2 decimal places were provided so that is appropriate.

Track plots and Header Check were run to check for any errors that might have crept into the files. None were found.

Plots of the new channels were examined together with nitrates to look for problems. The only outliers noted had been flagged by the analysts.

The reference papers were found in pdf format and are currently stored in the archive folder:

OSD\_DATA\_Archive:\Cruise\_Data\Documents\Analysis Reports and Reference Papers