



# Salinity Correction

## data processing

*SOCIB-Data Center Facility*

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<b>Description:</b>	This document describes the entire process related to the salinity correction performed in SOCIB in order to guarantee legacy data from RV and Glider Facilities to be used for both operational and scientific purposes.
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## *Index of Contents*

<b>INTRODUCTION</b>	<b>4</b>
<b>Related documents</b>	<b>4</b>
<b>Required Features</b>	<b>5</b>
<b>PROCEDURE DEVELOPMENT</b>	<b>5</b>
Data gathering	5
Salinity samples	5
CTD datasets	5
Glider datasets	6
Salinity Correction Toolbox	6
CTD data	6
Glider data	7
Results verification	7
CTD data	7
Glider data	10

## 1. Introduction

This document describes the entire process related to the salinity correction performed in SOCIB in order to guarantee legacy data from RV and Glider Facilities to be used for both operational and scientific purposes.

## 2. Related documents

Name:	Link to source:
RV Facility Data Management Plan	<a href="https://repository.socib.es:8643/repository/entry/show?entryid=3f66c479-8355-4485-aa43-9c420db9d8d7">https://repository.socib.es:8643/repository/entry/ show?entryid=3f66c479-8355-4485-aa43-9c420 db9d8d7</a>
Glider Facility Data Management Plan	<a href="https://repository.socib.es:8643/repository/entry/show?entryid=cc90e6c3-ba04-4131-810a-ecb0560428c9">https://repository.socib.es:8643/repository/entry/ show?entryid=cc90e6c3-ba04-4131-810a-ecb05 60428c9</a>
BPMN salinity correction data process	<a href="https://repository.socib.es:8643/repository/entry/show?entryid=cb23e87f-f855-4aa7-a855-b7f1b79fd12d">https://repository.socib.es:8643/repository/entry/ show?entryid=cb23e87f-f855-4aa7-a855-b7f1b7 9fd12d</a>
Salinity correction data flow process	<a href="https://repository.socib.es:8643/repository/entry/show?entryid=5297cb13-a888-4a61-8c29-588ced9e5bfd">https://repository.socib.es:8643/repository/entry/ show?entryid=5297cb13-a888-4a61-8c29-588ce d9e5bfd</a>
RV Facility Data Integration process	<a href="https://repository.socib.es:8643/repository/entry/show?entryid=4a103efb-e21a-454f-815e-aa27486ab74b">https://repository.socib.es:8643/repository/entry/ show?entryid=4a103efb-e21a-454f-815e-aa274 86ab74b</a>

### 3. Required Features

- Desktop or laptop.
- Access to Operational Salinity Correction Toolbox.
- Access to required data from salinity analysis, CTD and Glider.
- Python 2.7
- plot\_ts\_diagrams python library

### 4. Procedure Development

#### 4.1. Data gathering

##### 4.1.1. Salinity samples

- Ensure that salinity samples have been analysed and data have been backed-up according to the the **SOP\_RVF\_portosal8410-salinity-analysis**.

Further details about this procedure available through the following link:

<http://repository.socib.es/repository/entry/show?entryid=b82960e4-540f-4c22-be81-6b3eb9fdde1e>

##### 4.1.2. CTD datasets

- CTD data pre-processing using manufacturer software:
  - Ensure that CTD data has been pre-processed and backed-up according to the the **SOP\_RVF\_SBEprocessing-software-execution**.

Further details about this procedure available through the following link:

<http://repository.socib.es/repository/entry/show?entryid=0fb1b103-6134-487d-adc7-2d849c150f6d>



- Available SBE processing software configurations may be found through the **SOP\_RVF\_SBE-processing-software-configuration**. This document is useful also in order to generate new configurations if required.

Further details about this procedure available through the following link:

<http://repository.socib.es/repository/entry/show?entryid=3fa09c4f-d21e-49e6-a2ca-f4b916c357aa>

- CTD data processing using SOCIB software:

- Ensure that CTD data has been processed and stored in Thredds server, according to the the **SOP\_RVF\_CTD-data-processing**.

Further details about this procedure available through the following link:

<http://repository.socib.es/repository/entry/show?entryid=f8d3c21f-a7d0-46a0-81c5-1d56b6441984>

- Available processing configurations may be found through the **SOP\_RVF\_CTD-SBE90-process-configuration**. This document is useful also in order to generate new configurations if required.

Further details about this procedure available through the following link:

<http://repository.socib.es/repository/entry/show?entryid=95f9aaba-be43-4c1e-bfef-0be44dc4b589>

#### 4.1.3. Glider datasets

Ensure that Glider data has been pre-processed and backed-up according to the following Standard Operational Procedures:

- SOP\_DCF\_delayed-time-processing:  
<https://repository.socib.es:8643/repository/entry/show?entryid=712c46e3-1a5f-41cf-bc89-2578c6ad3fb4>
- SOP\_DCF\_delayed-time-processing-addendum-GTBv1.3.X:  
<https://repository.socib.es:8643/repository/entry/show?entryid=c27216d7-e233-4006-a262-ac99fab1f050>

### 4.2. Salinity Correction Toolbox

#### 4.2.1. CTD data

- Salinity correction for CTD data is performed using the SOCIB Salinity Correction Toolbox pack named **ctd-salinity-correction-pack**, that is available through either SOCIB Git repository or GitHub at [github.com/socib/salinity-correction-toolbox](https://github.com/socib/salinity-correction-toolbox).

The user manual **PUM\_DCF\_salinity-correction-toolbox-user-manual** can be found at:

[repository.socib.es/repository/entry/show?entryid=74d6c56a-0c87-4790-8e0b-5896b540557c](https://repository.socib.es/repository/entry/show?entryid=74d6c56a-0c87-4790-8e0b-5896b540557c) and its contribution to Ocean Best Practices is provided at [dx.doi.org/10.25607/OPB-430](https://dx.doi.org/10.25607/OPB-430).

#### 4.2.2. Glider data

- Salinity correction for Glider data is performed using the SOCIB Salinity Correction Toolbox pack named **glider-salinity-correction-pack**, that is available through either SOCIB Git repository or GitHub at [github.com/socib/salinity-correction-toolbox](https://github.com/socib/salinity-correction-toolbox).

The user manual **PUM\_DCF\_salinity-correction-toolbox-user-manual** can be found at:

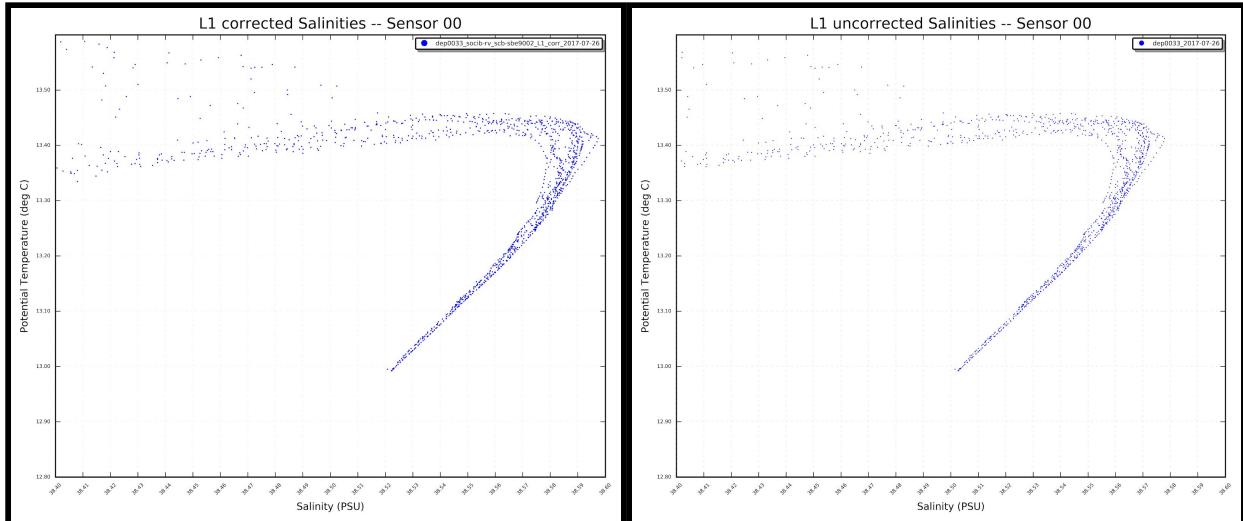
[repository.socib.es/repository/entry/show?entryid=74d6c56a-0c87-4790-8e0b-5896b540557c](https://repository.socib.es/repository/entry/show?entryid=74d6c56a-0c87-4790-8e0b-5896b540557c) and its contribution to Ocean Best Practices is provided at [dx.doi.org/10.25607/OPB-430](https://dx.doi.org/10.25607/OPB-430).

### 4.3. Results verification

Salinity correction results may be verified using the different plotting tools available in the python library **plot\_ts\_diagrams**. This library is available in the internal SOCIB GIT repository.

#### 4.3.1. CTD data

- **plot\_ctd.py**: Will generate individual Theta/S plots with both corrected and uncorrected salinities for sensor 00 and sensor 01.

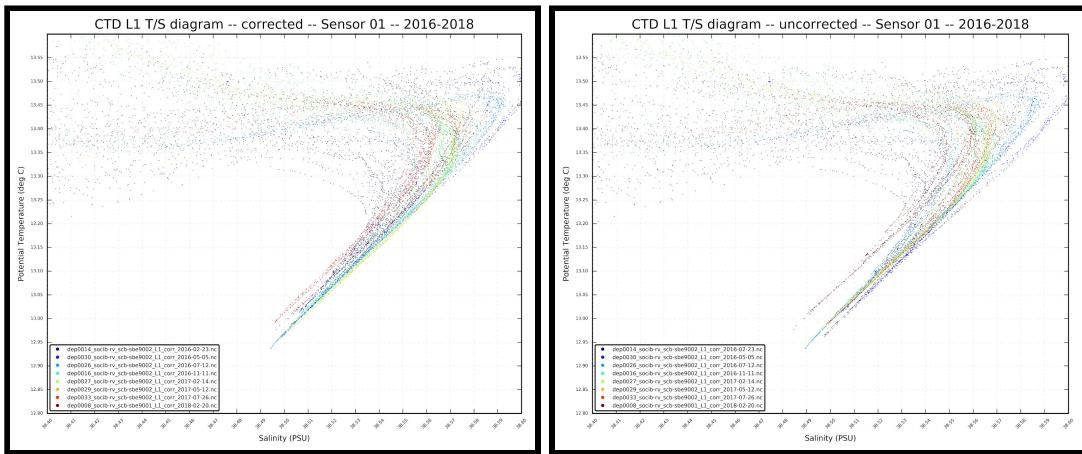


**NOTE:** The plots generated can be plotted in A4 using width of 222 mm and height of 186 mm as in the figure below. This allows the user to easily check with a ruler the differences in salinity considering the conversion 1mm = 0.01 psu in the X axis:

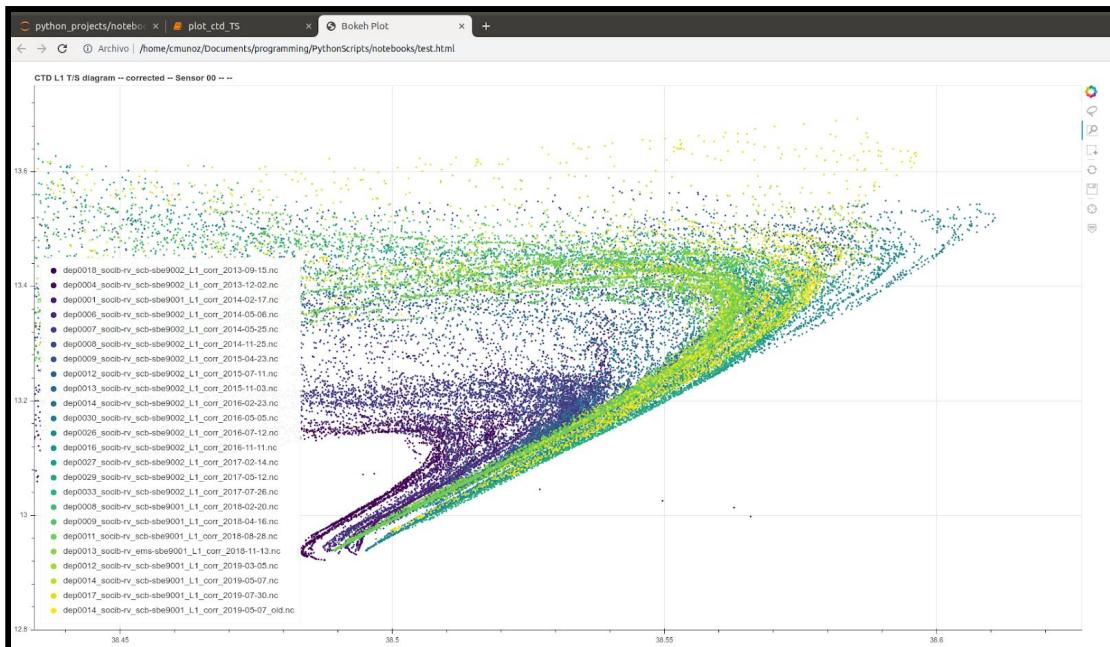


- **plot\_ctd\_dm.py:** Will generate multi Theta/S plots for either corrected or uncorrected salinities and also sensor 00 or sensor 01.

**NOTE:** Same as above, the plots generated can be plotted in A4 using width of 222 mm and height of 186 mm. This allows the user to easily check with a ruler the differences in salinity considering the conversion 1mm = 0.01 psu in the X axis



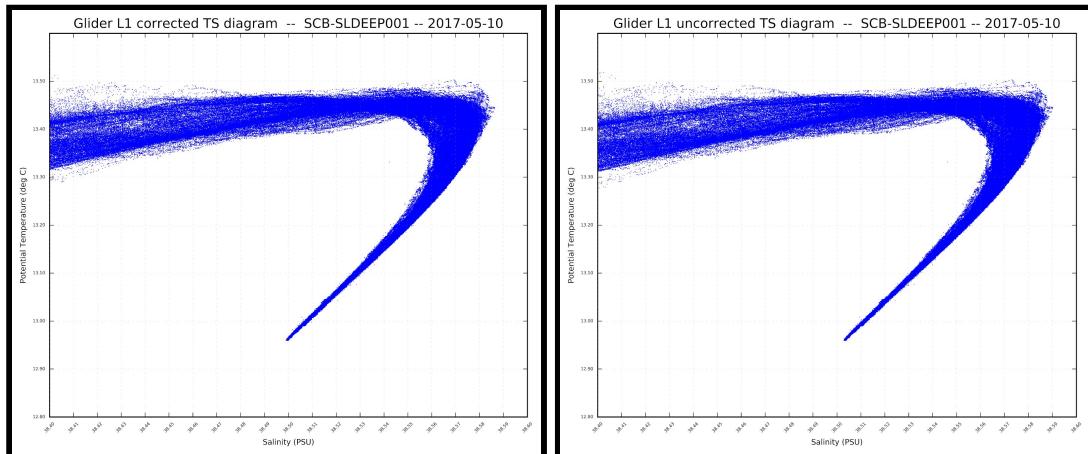
- **plot\_ctd\_TS.ipynb:** This python notebook allows the user creating multiple Theta/S diagrams using bokeh libraries to generate html files for interactively play and compare different Theta/S distributions:



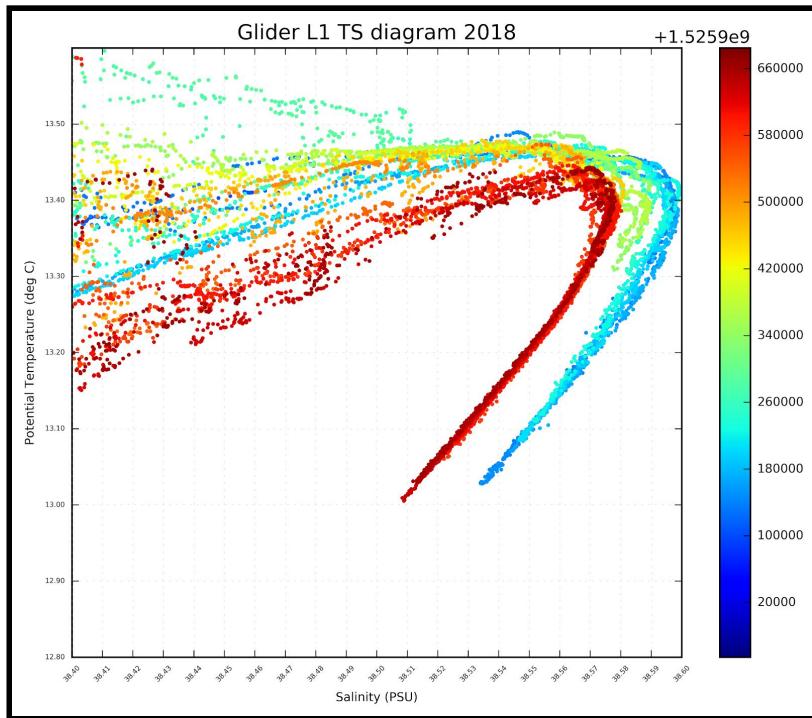
#### 4.3.2. Glider data

- **plot\_single\_glider\_time.py:** Will generate individual Theta/S plots with both corrected and uncorrected salinities.

**NOTE:** Same as above, the plots generated can be plotted in A4 using width of 222 mm and height of 186 mm. This allows the user to easily check with a ruler the differences in salinity considering the conversion 1mm = 0.01 psu in the X axis

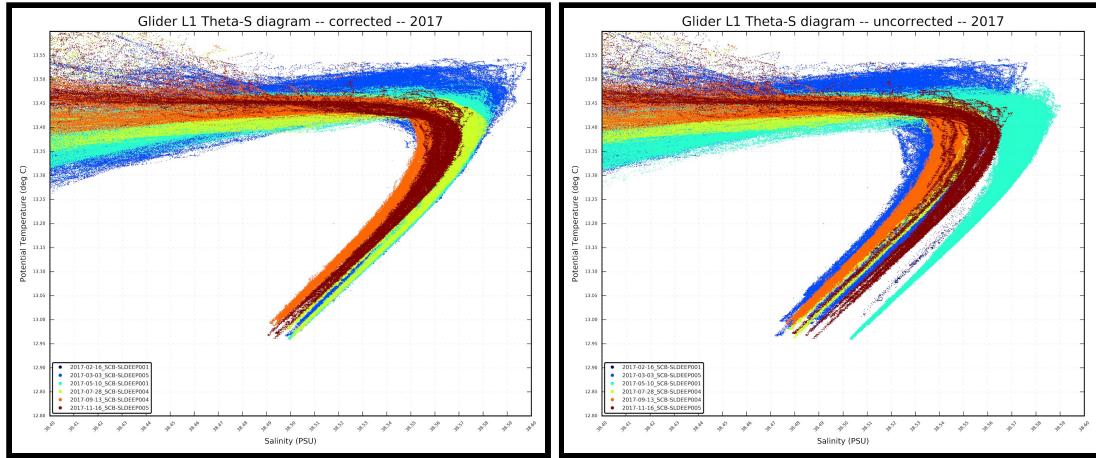


This function also allows to add time dimension over the Theta/S distribution in order to assess temporal variations:

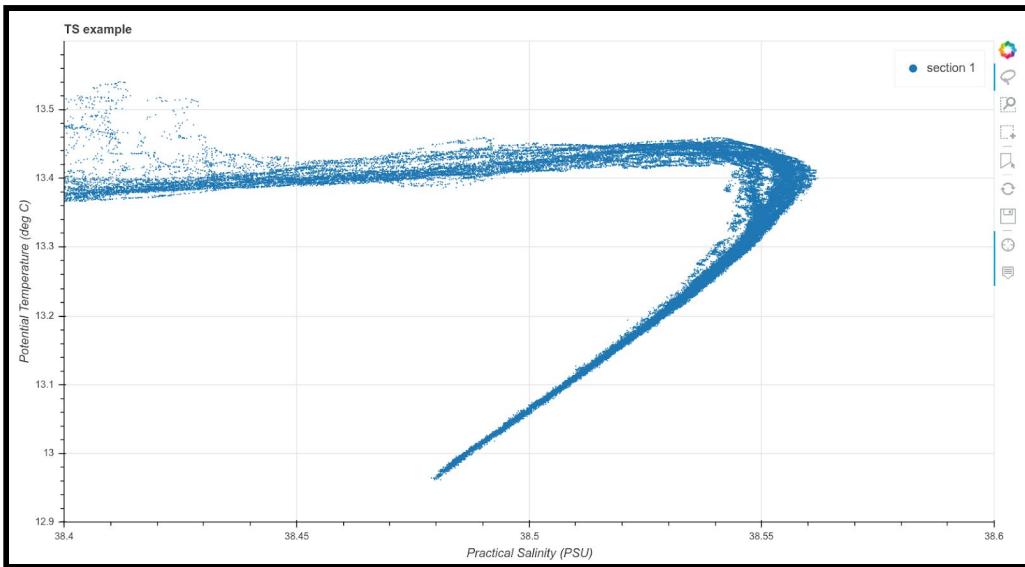


- **plot\_glider\_dm.py:** Generates multi Theta/S plots for either corrected or uncorrected salinities.

**NOTE:** Same as above, the plots generated can be plotted in A4 using width of 222 mm and height of 186 mm. This allows the user to easily check with a ruler the differences in salinity considering the conversion 1mm = 0.01 psu in the X axis



- **plot\_ts\_glider\_sections.ipynb:** This python notebook allows the user creating individual Theta/S diagrams using bokeh libraries to generate html files for interactively plot specified sections of the glider dataset according to specific ranges of indices. This tool becomes in handy in order to isolate specific sections to be corrected individually. Theta/S distributions may also be plotted according to the profile indices (-1, 0, 1) instead:



- **plot\_ctd\_TS.ipynb:** Same as in CTD case, this python notebook allows the user creating multiple Theta/S diagrams using bokeh libraries to generate html files for interactively play and compare different Theta/S distributions:

