

RV Mtafiti training workshop
Mombasa, April 2016

Underway data storage and processing

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Physical oceanography : ThermoSalinoGraph (SBE21)



Pumped system installed on the ship
Takes water from approx. 3m depth
Flow rate should $>0.8 < 1.2$ l/sec
Sampling interval 5sec (minimum)



Data Center VLIZ , KMFRI



Mtafiti training workshop

Underway data types

- GPS: position, course, speed, UTC time
- Echo sounder: bottom depth
- Gyro: heading
- Meteo system: atm.pressure, rel.humidity, wind speed & direction, air temperature
- **SBE21 thermosalinograph : seawater temperature, conductivity, salinity**
- Fluorimeter : chlorophyllA



Underway data relevance

- Scientific background information
- Correct position & time (GPS)
- Quality control on recorded data
 - Position of sample vs ship speed
 - CTD max depth vs bottom depth
 - CTD temp&sal vs UW temp&sal
 - Trawling operations vs ship speed



Raw SBE21 TS data

- HEX values stored in data logger memory
 - Organised per cast
 - Not readable
 - Downloaded over RS332
- Configuration file describes sensors & calibration parameters
 - Changes when sensors are added/removed
 - Changes per calibration
 - Pre- post cruise calibration



Primary Seabird ctd data processing

HEX file

```
07D87516C0EF0806954D4C0878CD74
07D8D716C08308064F4D4C0861C61E
07D97116BD720805A64D4D0837A43F
07D90716BD6E0805084D4B0802A502
07D8B516BD420805244D4E082DB134
07D87516BCAE0805D24D4D0835CAD9
07D85A16C0680806894D4B084ECE0E
07D93D16C2A90806CA4D4B084BCD1F
```

Configuration file

```
4930
0.0 0.00000000e+000 0.00000000e+000 0.00000000e+000 0.00000000e+000 -9.57000000e-008
2000.0000 0.0000 1.00000000 0.00000 1

0.000 0.00000000e+000 0.00000000e+000 0.00000000e+000 0.00000000e+000 1.00000000 0.0000 1

0.0 0.00000000e+000 0.00000000e+000 0.00000000e+000 0.00000000e+000 0.00000000e+000 -9.57000000e-008
2000.0000 0.0000 1.00000000 0.00000 1

0.000 0.00000000e+000 0.00000000e+000 0.00000000e+000 0.00000000e+000 1.00000000 0.0000 1

0.000000e+000 0.000000e+000 0.000000e+000 0.000000e+000 0.000000e+000 0.000000e+000 1.00000000
0.000000e+000 0.000000e+000 0.000000e+000 0.000000e+000 0.000000e+000 0.000000e+000 1.00000000
0.000000e+000 0.000000e+000 0.000000e+000 0.000000e+000 0.000000e+000 0.000000e+000 1.00000000
```

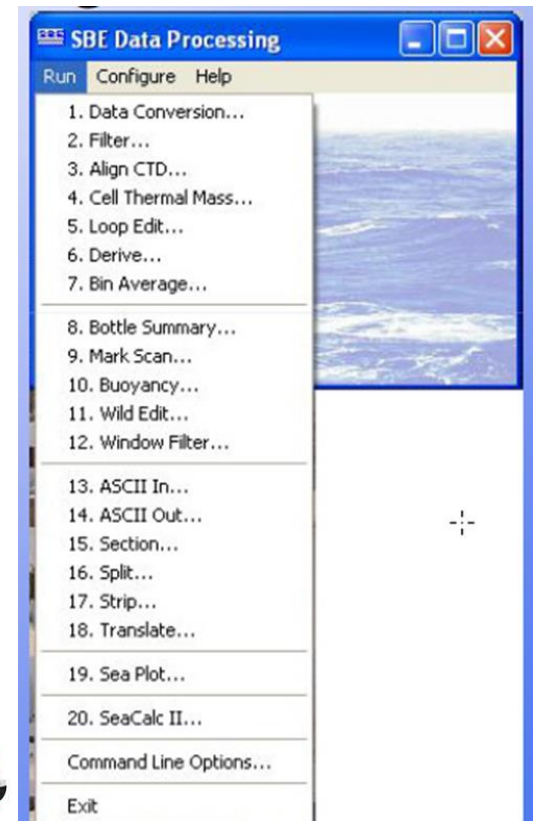
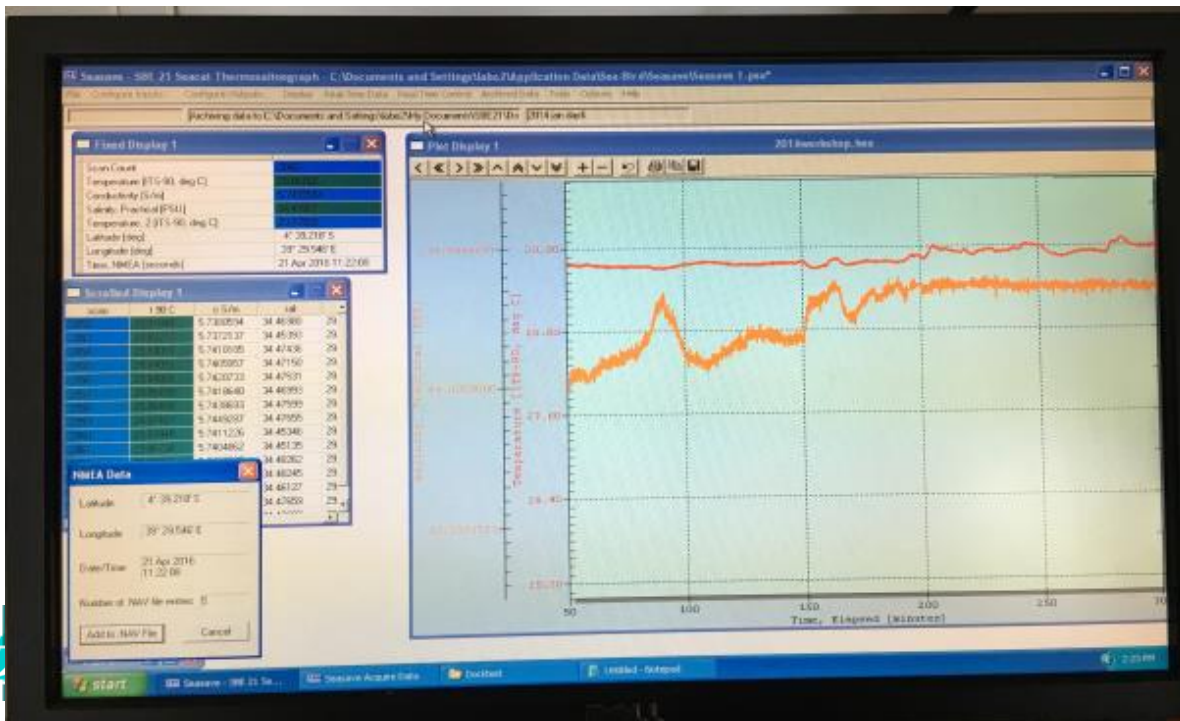
Processed file

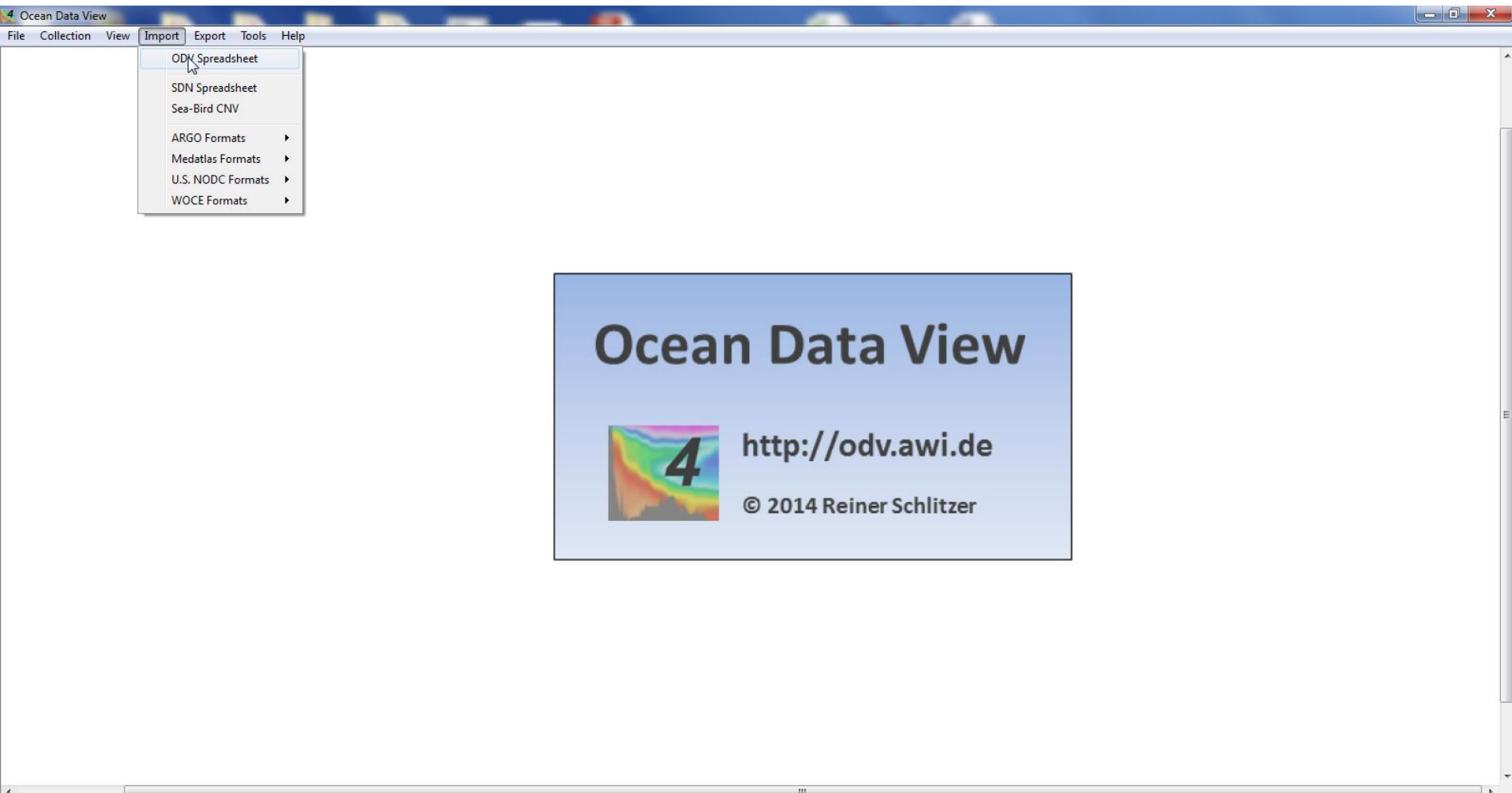
```
* Sea-Bird SBE 21 Data File:
* FileName = C:\Documents and Settings\labo2\My Documents\SBE21\Docktest
\2016workshop.hex
* Software Version Seasave V 7.22.5
* Temperature SN = 3051
* Conductivity SN = 3051
* Append System Time to Every Scan
* System Upload Time = Apr 21 2016 07:46:32
* NMEA Latitude = 04 39.09 S
* NMEA Longitude = 039 24.35 E
* NMEA UTC (Time) = Apr 21 2016 04:45:22
* Store Lat/Lon Data = Append to Every Scan
** Ship: Mtafiti
** Station:
** Operator:
* Real-Time Sample Interval = 6.0000 seconds
* System UTC = Apr 21 2016 04:46:32
# nquan = 8
# nvalues = 6052
# units = specified
# name 0 = c05/m: Conductivity [S/m]
# name 1 = t090C: Temperature [ITS-90, deg C]
# name 2 = t190C: Temperature, 2 [ITS-90, deg C]
# name 3 = sal00: Salinity, Practical [PSU]
# name 4 = latitude: Latitude [deg]
# name 5 = longitude: Longitude [deg]
# name 6 = timeQ: Time, NMEA [seconds]
# name 7 = flag: 0.000e+00
```



Seabird ctd data processing

- Software: SBE SeaSoft
 - Real-time data acquisition: Seasave
 - Data processing and plotting: SBE data processing
 - (<http://www.seabird.com/software/software>)





Exercises

- 1) Visualise archived data for day1 cruise using seasave
- 2) Visualise day1 cruise in ODV on an XYZ surface map
- 3) Visualise day1 temperature at intake in scatter time series
- 4) QC: remove and flag outliers from day1 time series

