FRM4SOC LCE-2 Data and results to be submitted by the participants

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Toravere 2017

#### Content

General rules for dataInstrument specific

# Calibration standards

Calibration sources + certificates from NPL
Reflectance standard calibrated at NPL during LCE-1
Auxiliary equipment (logging hardware, environment, distance etc.): from Estonian and Finnish NMI's)



# Instrument calibration data

Calibrated at TO during LCE-2
File formats following existing examples
Certificates will be provided after LCE-2
Raw data available on demand
Clarification of the measurement conditions etc.





#### LCE-2 exercises

Instrument calibration
Indoor exercise: irradiance
Indoor exercise: radiance
Primary outdoor exercise: L<sub>d</sub>, L<sub>u</sub>, E<sub>d</sub>
Secondary outdoor exercise: E<sub>d</sub>, L<sub>w</sub> (R<sub>rs</sub>)
Auxiliary data during the fieldwork provided by TO

### General rules for data

•Tab delimited text files •Short self-explaining filenames •Descriptive file and column headers •First column: pixel/channel no. •Second column: wavelength •Following columns: sensor radiometric reading •Data divided into casts/series •Outliers filtered out or corrected •Timestamps (GMT recommended) •Integration times, gains, temperatures (when available) •Metadata if relevant (scene description etc.) •Average and stdev of average over series/casts

## Indoor exercises: radiance, irradiance

For intercomparison:
Radiance/irradiance values calculated by participants based on measured data and provided calibration
Averaged over series
Uncertainty budget
Spectral data interpolated to 2.5 nm step
All calculation steps/corrections explained

On demand: raw and intermediate datafiles

## Primary outdoor exercise

For intercomparison:
•E<sub>d</sub>, L<sub>d</sub>, L<sub>u</sub> values
•Averaged over casts
•Uncertainty budget
•Calculated for OLCI channels
•All calculation steps/corrections explained

On demand: raw and intermediate datafiles

#### Secondary outdoor exercise

For intercomparison:
•E<sub>d</sub>, L<sub>w</sub>, (R<sub>rs</sub>) values
•Averaged over casts
•Measurement geometry
•Uncertainty budget
•Calculated for OLCI channels
•All calculation steps/corrections explained

On demand: raw and intermediate datafiles



#### Instrument classes

TriOS RAMSES ARC, ACC SATLANTIC HyperOCR, OCR-3000 WISP3 Spectral Evolution RS-3500 CIMEL CE318

# TriOS RAMSES ARC, ACC



Documented protocol
Raw ADC data available
Background (dark non-uniformity) and black pixels
SAMIP pixel no. 32 issue





# Satlantic HyperOCR, OCR-3000

Well-documented protocol
Raw ADC data available
Output: binary
Proprietary or third-party software
Internal mechanical shutter
Selectable dark frames freq.: every 5<sup>th</sup> during calibration



#### WISP3

Optical inputs for  $E_d$ ,  $L_d$ ,  $L_u$ Ocean Optics JAZ spectrometer inside Water Insight WISP script used during LCE-2 Output: text files Not raw: modified for dark and linearity, smoothed Integration time not accessible No comments - timestamp only! Selectable averaging (field work) Illumination needed for all 3 inputs!



# Spectral Evolution RS-3500

Only the VIS-NIR module used during LCE-2 Proprietary software Output: text files Cal factors not accessible Dark subtracted internally Selectable averaging and integration times Selectable input configuration (affects the cal coefs)



# CIMEL CE318

Multispectral (OLCI channels)
Raw sensor output voltages
Using robot for second outdoor only
Measurement scenarios



