"Case 1" working group

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Practical definitions:

clear(ish) water, vertically homogenous(ish); avoid Case1/2 terminology.

Fluorescence line height:

Hyperspectral and multispectral approaches differ
Nobody is validating the data
Will be on HySpIRI, ACE radiometers
BSI/Satl 665/683 channels, some (Stan's) have 710
Tricks: Raman correction,

ACE radiometer discussion bands: 665, 678, 710, O2 A-band splitting?
MERIS group thinks 665 is too long and 660 would be better (665 is on the shoulder of the fluorescence band)

Raman correction: can be activated for fluorescence bands

Theoretical issues? What is the cross-section? Resolved? Not. Large effects? 15% contribution to Lw green-red
Not needed for nLw validation? Needed? (looks that way)

Elastic scattering corrections also need to be investigated

DESIRED FOR PROCESSOR: Ability to process the data, research level – track to validation. Implement Raman correction experimentally.

PROTOCOL IMPACTS: instruments needed, wavelength choice selected, shallow water valid data collection must be improved: compressible bladder technology, multiple casts?

QUALITY INFORMATION: Research quality, evolve toward cal/val of MERIS and new sensors. Quality / performance metrics will vary with wavelength : UV and red bands are not as mature as the violet-yellow visible.

Extrapolation intervals:

Spectrally variable, of course: limited number of values or a different one for each band? UV/Blue-yellow vis for one, Red for another
LOV fits entire valid data profile to estimate water leaving values, 2nd degree exponential fit.

DESIRED FOR PROCESSOR: RECOMMENDATION that this approach be evaluated broadly to see if this improves the results / removes subjectivity and operator variance. Planned exercise for BOUSSOLE/PnB/BBOP will incorporate this.
Useful for legacy data recovery in absence of (good) Es measurements?

PROTOCOL IMPACTS: removes operator variance in cases of manual selection, or arbitrary fixed intervals, this goes into the code

QUALITY INFORMATION / UNCERTAINTY: can extract statistics from the curve fit for example, which may result in higher error estimates than may be necessary

Uncertainty budgets:

Develop stats from repetitive casts, but things change over time.
Develop stats from intercomparisons of instruments / corrections
Not all products sensitive to all error budget components (i.e. immersion coefficients drop out of R (Eu/Ed) calculations or Kd calculations)

Uncertainty Budget elements:

Radiometric calibration uncertainty / instrument characterization
Pressure calibration uncertainty (particularly for Kd)
Environmental conditions
    Non-homogeneous conditions (wave focusing, fronts, sun angles, clouds)
    Biofouling / spray fouling, instrument placement (Es sensors)
Specifics of package / ship perturbation, corrected or not
Data processing code and methods:
    Extrapolation intervals, Es normalization, tilt filtering
Temperature / dark response (not as important for surface/calval applications)

REQUIRED:

Restart of SIRREX-like activity to assess calibration uncertainty
Must put uncertainties on bio-optical models.
Everyone must go through exercise of understanding error budgets. Much of the information required is going to be static/accessible/etc.

RECOMMENDATION:

Need to investigate more details for common classes of instruments: can't exhaustively do each one …
Model comparisons?

PROTOCOL IMPACTS:

Single isolated casts deprecated, triplicates suggested, if time a factor make duplicate casts shallower and at least one deep cast.
Document non-optimal conditions (e.g. Es sensor placement)
Calibration facilities participate in SIRREX-like activities
Ancillary measurements! Ctd/bottle casts recommended
Met data: required for processing qualitatively, but calibrated data not necessarily essential.
Sun must be abaft the beam
Distance from the ship (20-30 m, literature says at least 9, ship size dependent, lots of variables)