CDM Absorption Forward and Inverse Model Comparisons

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Motivation

• To study the relationships between CDM absorption and Remote Sensing Reflectance

• To evaluate inversion model methods for CDM absorption

• To evaluate the sensitivity of Hydrolight output by varying bb/b

• To evaluate the sensitivity of inversion model by varying spectral slope
Forward Model: Hydrolight

• apart & cpart → Rrs, Ed, Eu at surface

• Station 1 bb/b = 0.013 (estuary)
• Station 2 bb/b = 0.01 (mouth)
Forward Model Rrs Comparison

- measured
- bb/b=0.01
- bb/b=0.013
- bb/b=0.015
- bb/b=0.02
- bb/b=0.025
- bb/b=0.027
- bb/b=0.03

Rrs (1/sr)

Wavelength (nm)
Inverse Model Methods

• MODIS OC4 $a_{CDOM}(400)$
  $Rrs \rightarrow a_{CDOM}(400)$

• Roesler & Perry 1995 $a_{CDM}(440)$
  $Eu/Ed \rightarrow a_{CDOM}(440)$
Inverse Model Results

• MODIS OC4 aCDOM(400)
  - poor agreement between model and measured data
    model aCDOM(400) < 0.05
    measured aCDOM(400) = 0.3

• Roesler & Perry 1995 aCDM(440)
  - excellent agreement between model and measured data
    Station 2: measured = 0.019
    model = 0.016
    Station 3: measured = 0.013
    model = 0.014
Spectral Slope Sensitivity Study for Cruise 1

- **measured**
- **$S=0.01$**

![Graph showing spectral slope sensitivity](image_url)
Conclusions

• Excellent aCDOM agreement between modeled and measured data for Roesler & Perry 1995 inversion method

• Roesler & Perry 1995 inversion method may work better in coastal waters than in estuarine waters (more data needed)

• MODIS OC4 inversion method yield poor results for this sample set