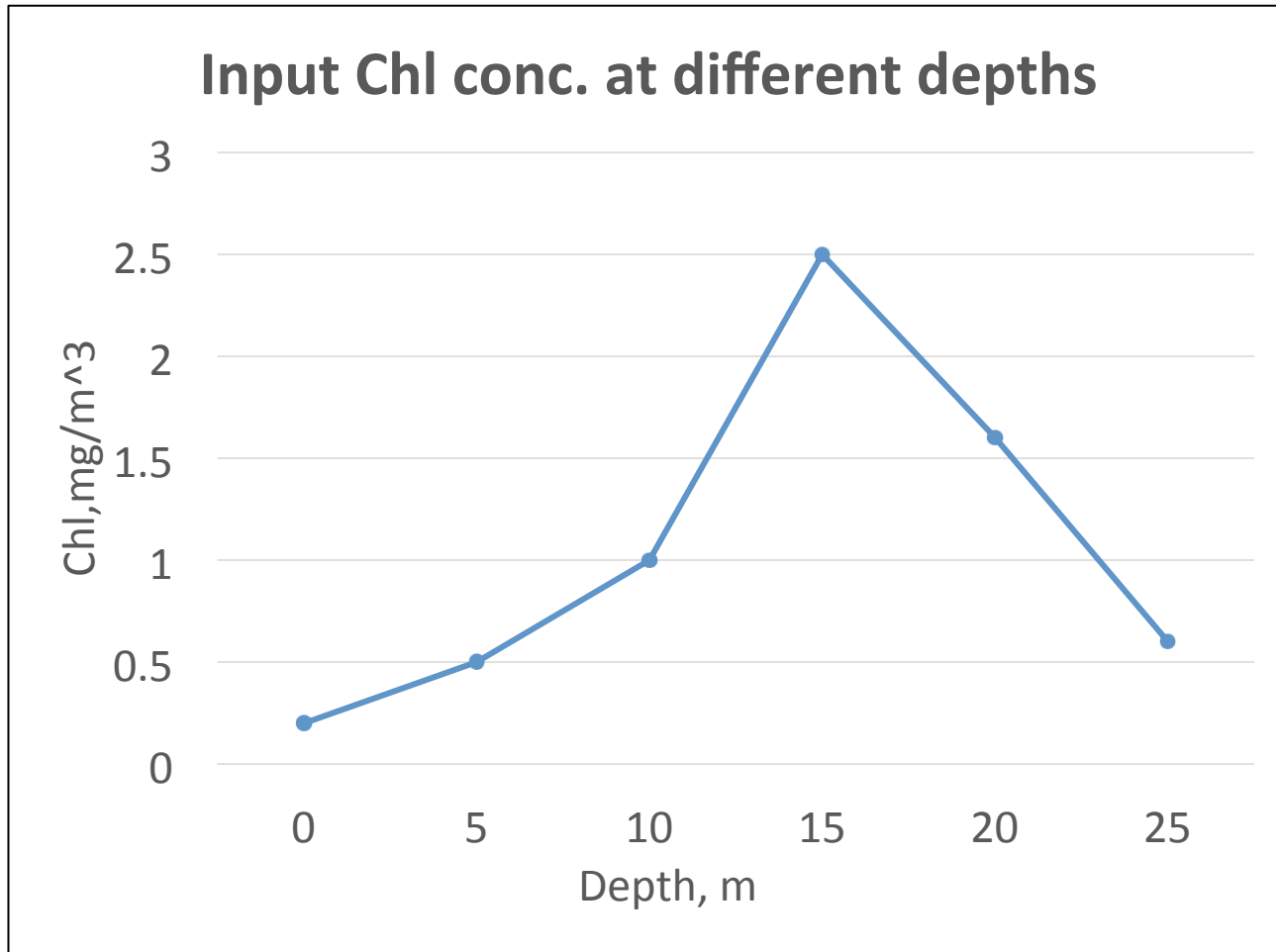
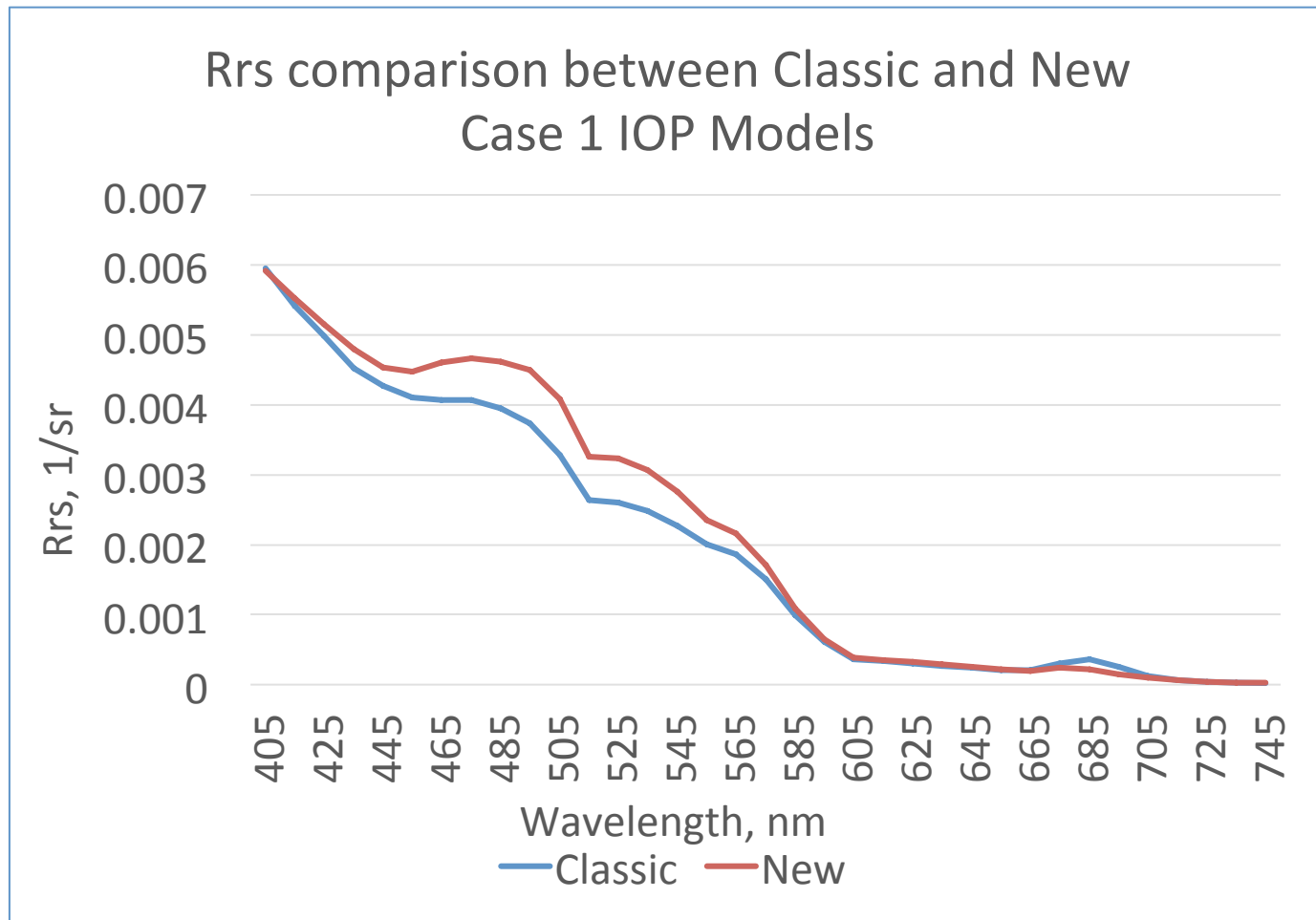


Lab 9

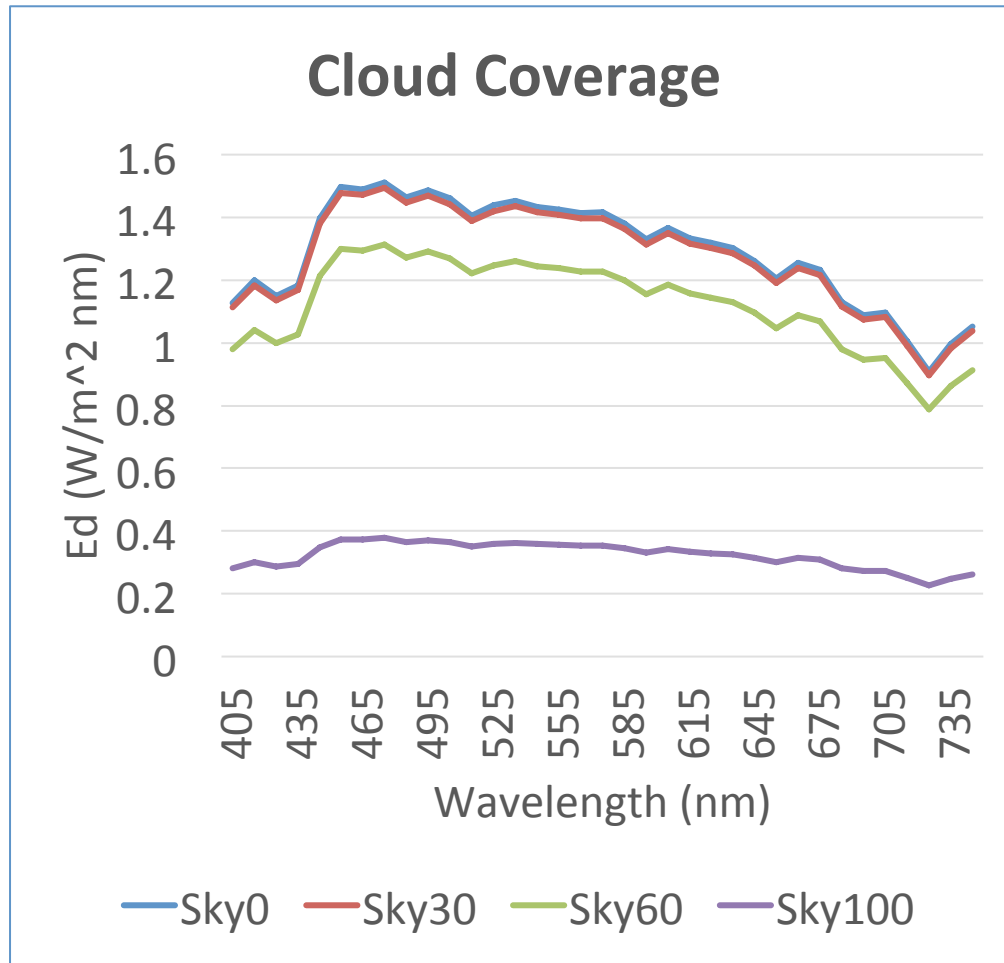
Hydrolight and Ecolight

Q1. Imputing measured Chl(z) data

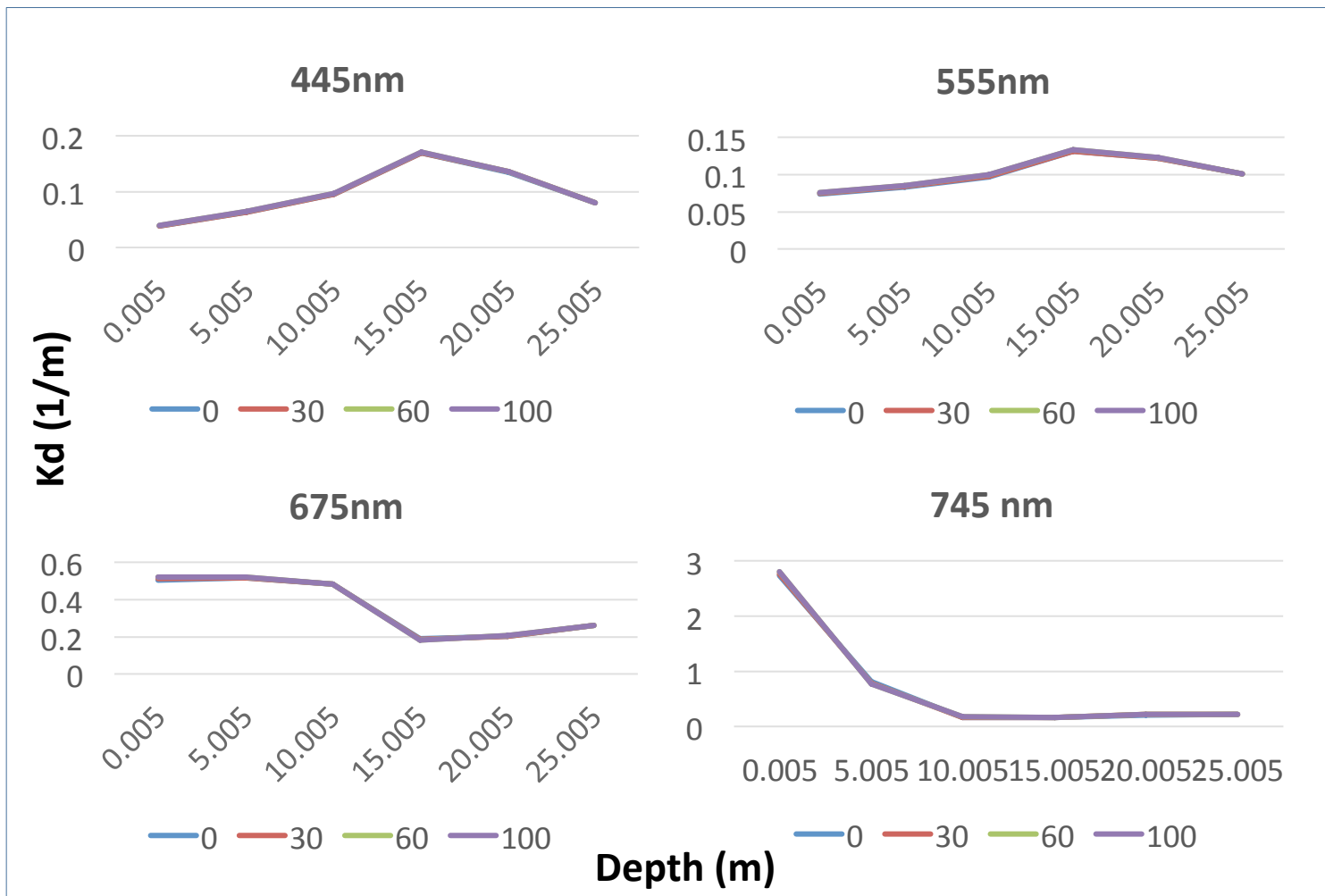




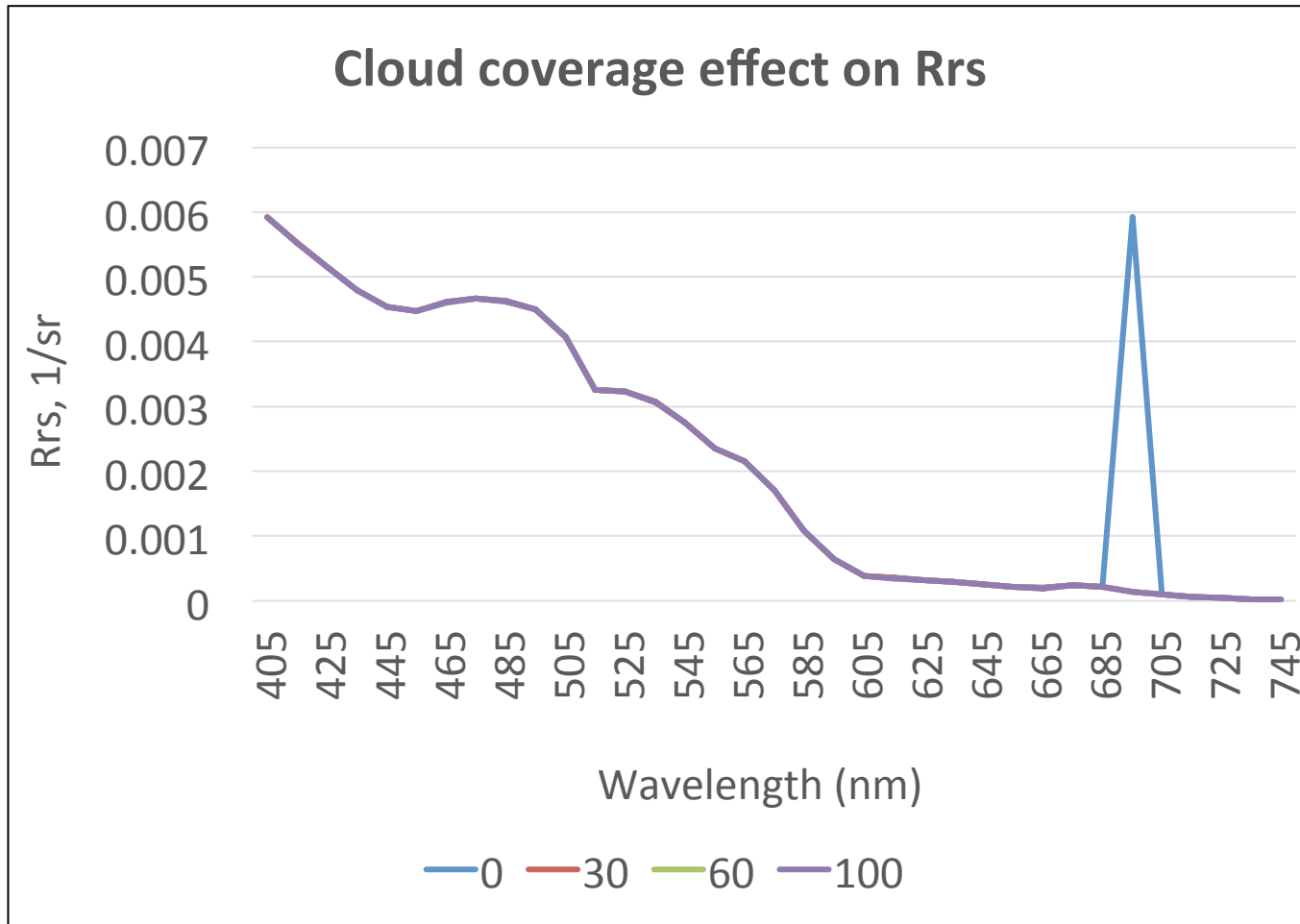
- Different models gave us various Rrs



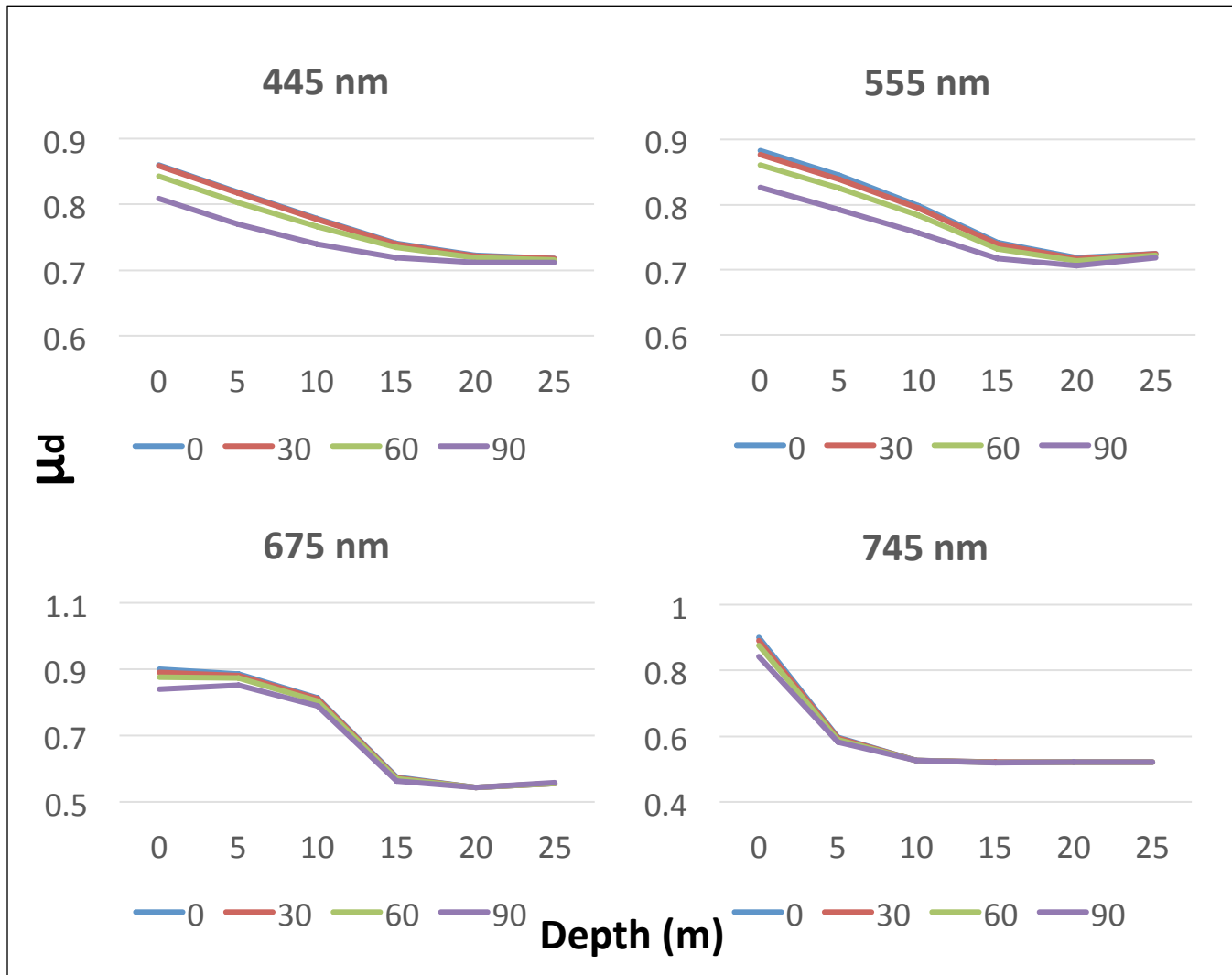
- Percent cloud coverage impacts E_d .



- Cloud has no effects on K_d .
- At wavelength of 445nm and 555nm, K_d has a similar trend as Chl conc.



- Cloud coverage has no effect on Rrs.
- But we had a outlier in our model output.



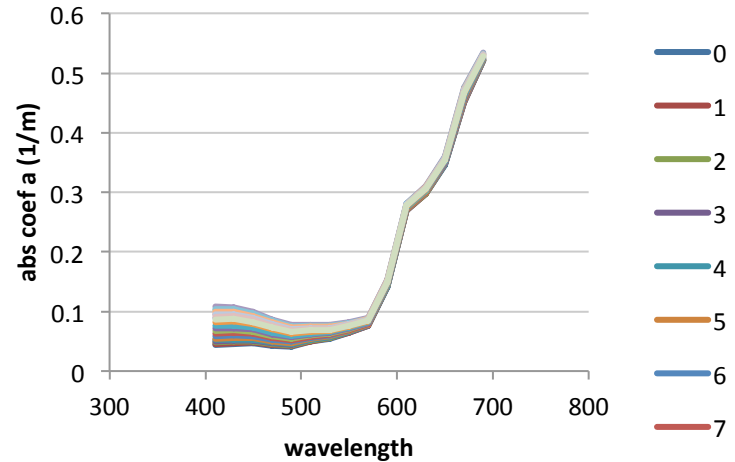
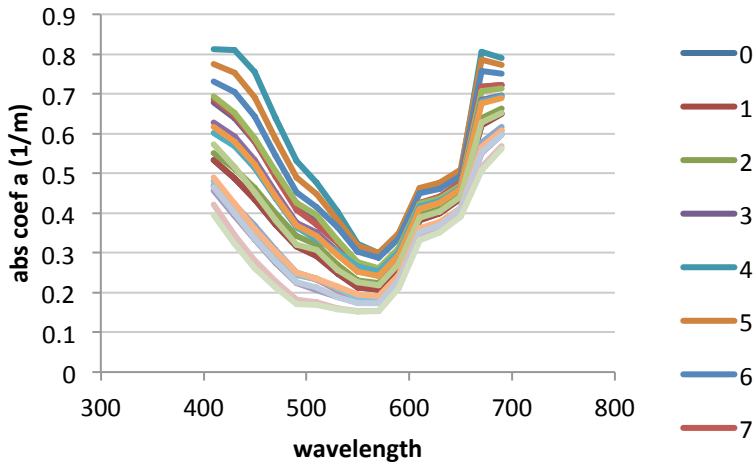
- As cloud coverage increases, μ_d decreases.
- Multiple scattering events cause μ_d to approach 0.5 with increasing depth.

Q2. Import IOPs

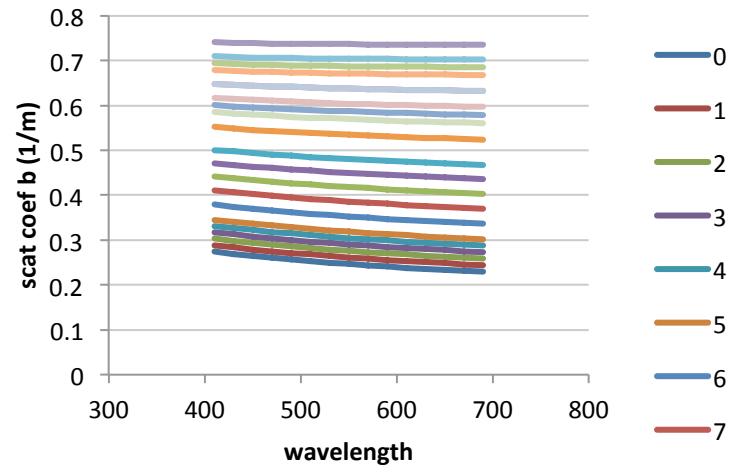
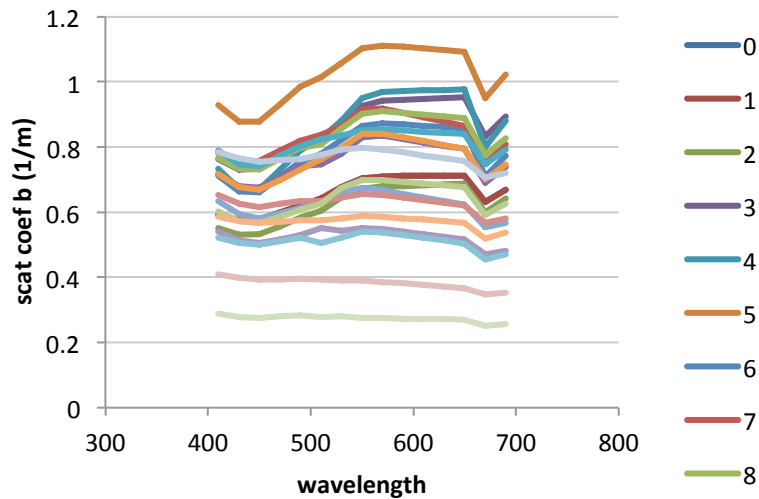
Using Custom IOPs

Assuming Case 1 Model IOPs

a



b

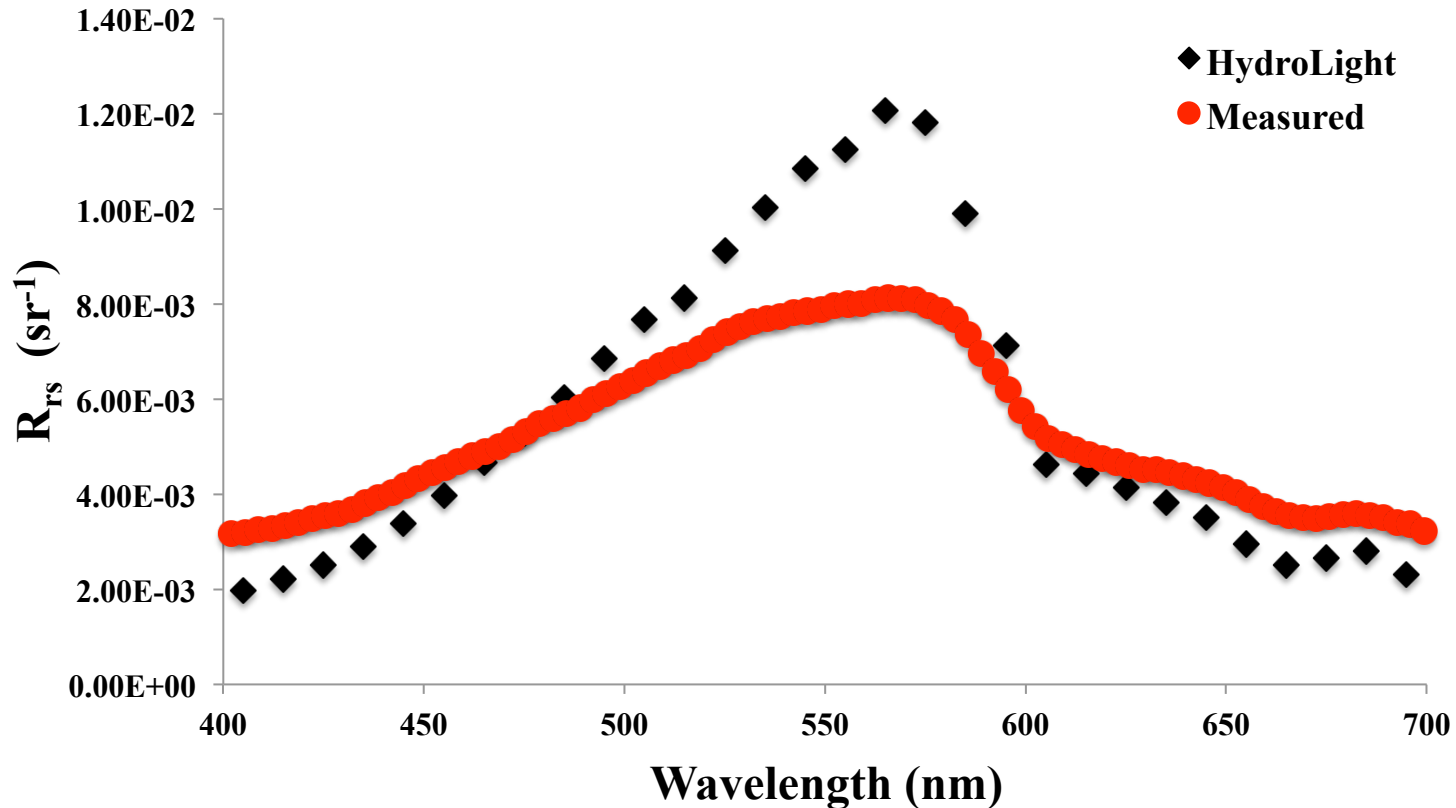


Predicted vs. Measured R_{rs}

HydroLight Input:

Parameter	Value	Instrument	Date
Absorption (a)	0.8 – 0.0 m ⁻¹	ACS	7/10
Attenuation (c)	4.0 – 2.0 m ⁻¹	ACS	7/10
b_b/b	0.01	BB9 & AC9	7/11
Chlorophyll	2.3 mg/m ³	Extraction method	7/12
CDOM	Variable	ACS with Filter	7/10
Depth	5 meters	Guess	-
a^*	Curt's File (astarchl)	-	-
Clouds	10%	Eye	7/15
Bottom Type	Dark Sediment	Guess	-
Wind Speed	2.0 m	Guess	7/15

Predicted vs. Measured R_{rs}

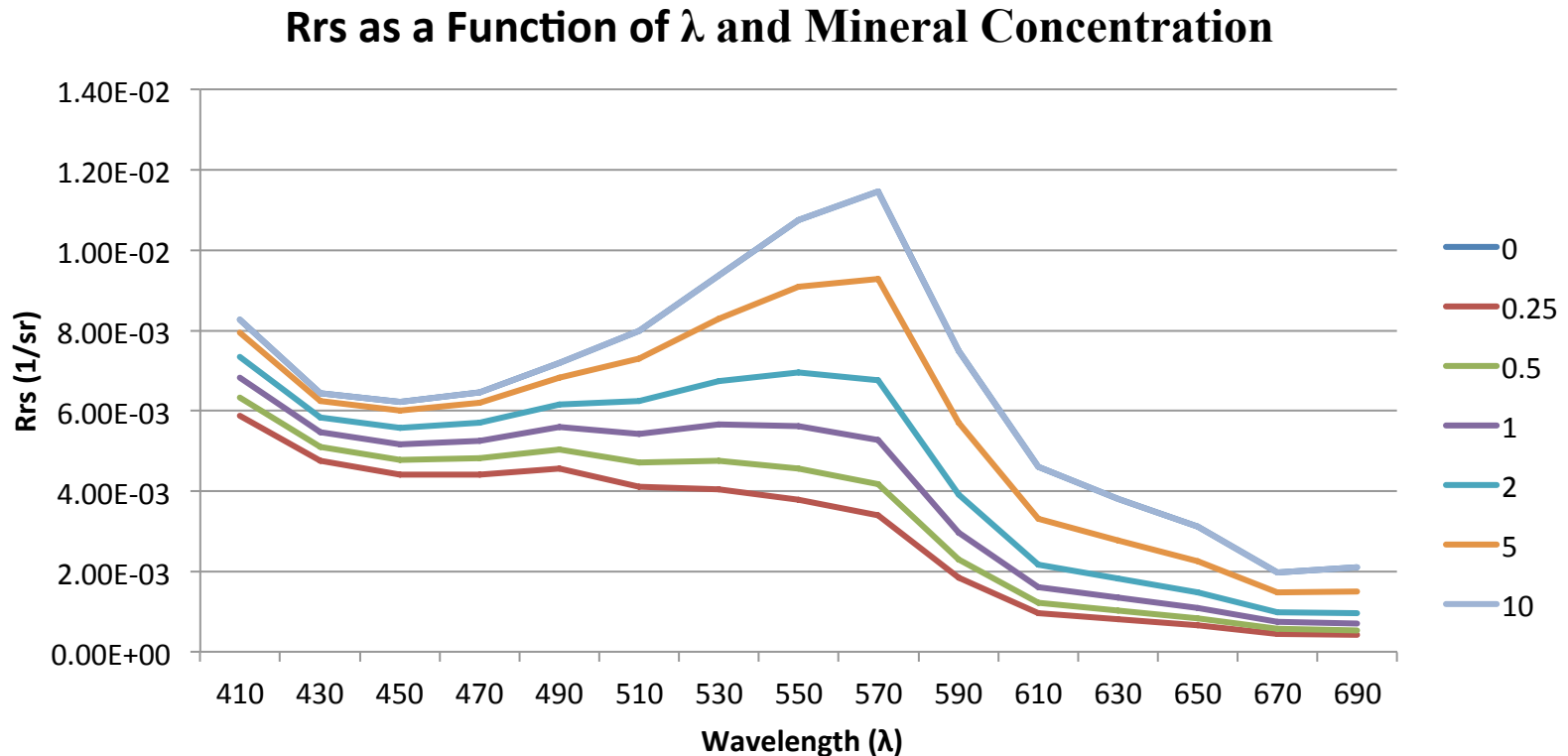


Reasonable, given that measurements were taken over a week long period (not ready to ask for my money back yet).

Captures the high absorption of CDOM in the blue, something not captured by the case 1 models.

Q3. IOP Case 2 water model

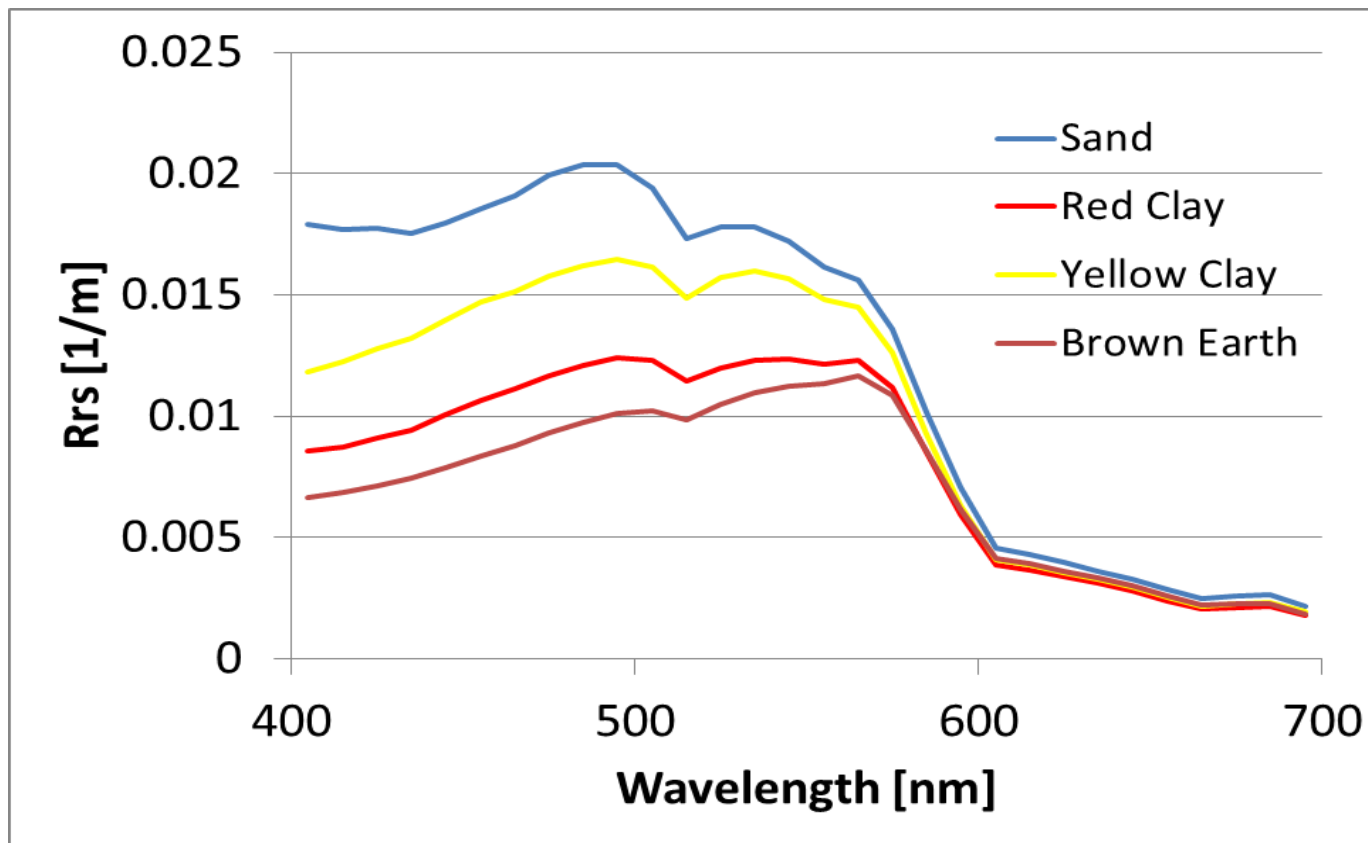
- Influence of the mineral concentration on the R_{rs}



- R_{rs} increases with the mineral concentration

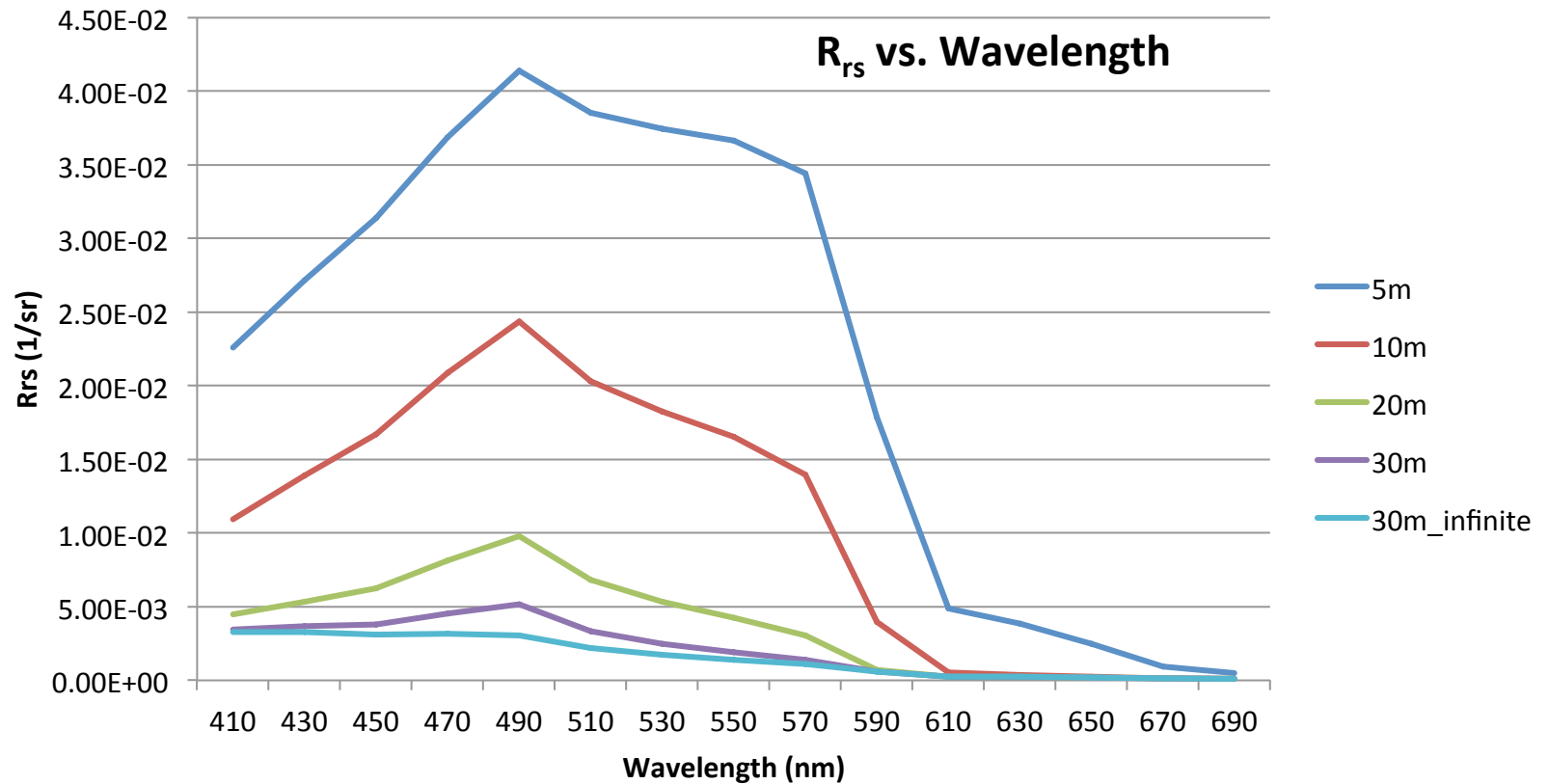
Q3. IOP Case 2 water model

- Influence of the mineral composition on the R_{rs}



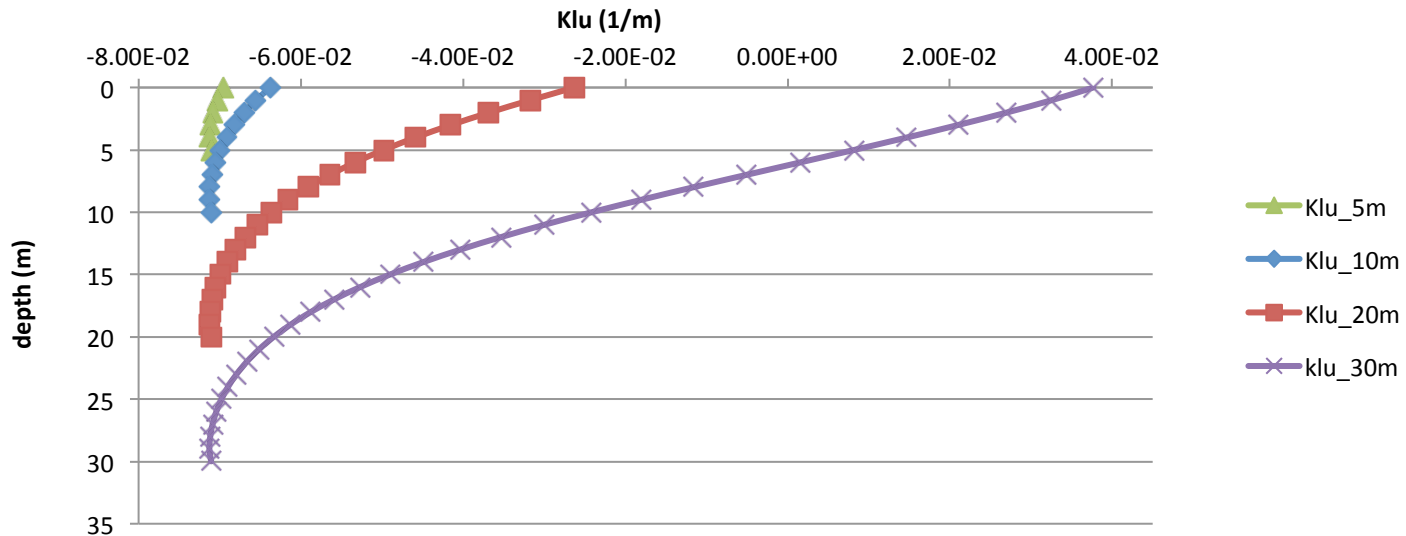
Q4. simulating optically shallow water

- Influence of the bottom reflectance on the R_{rs}

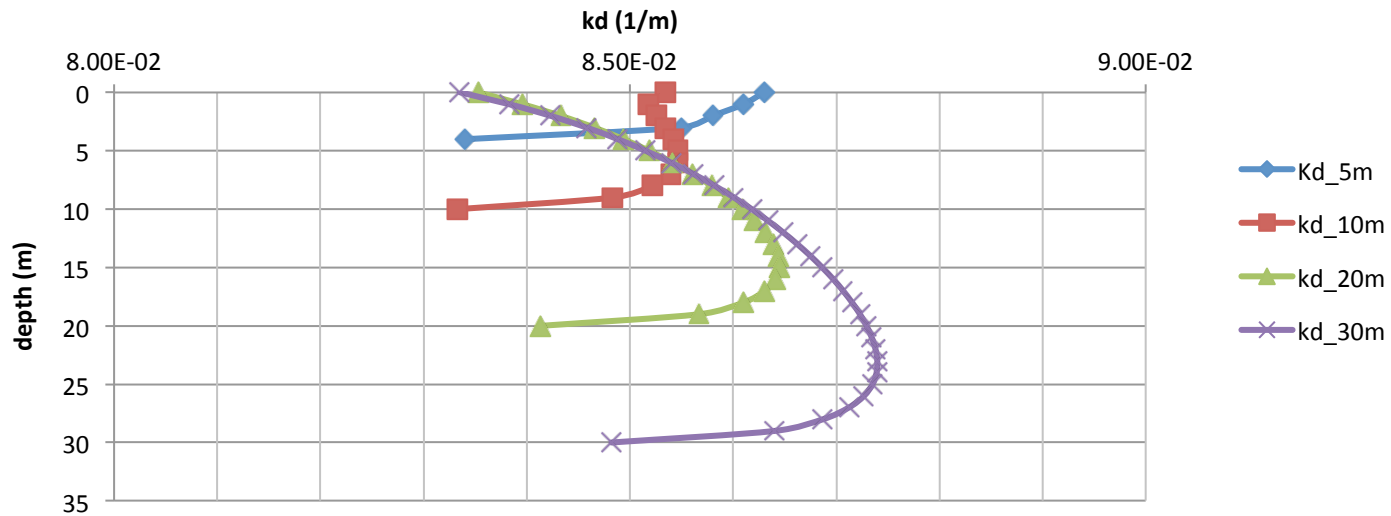


- Bahamas - Coral sand bottom
- Higher R_{rs} for shallower bottoms

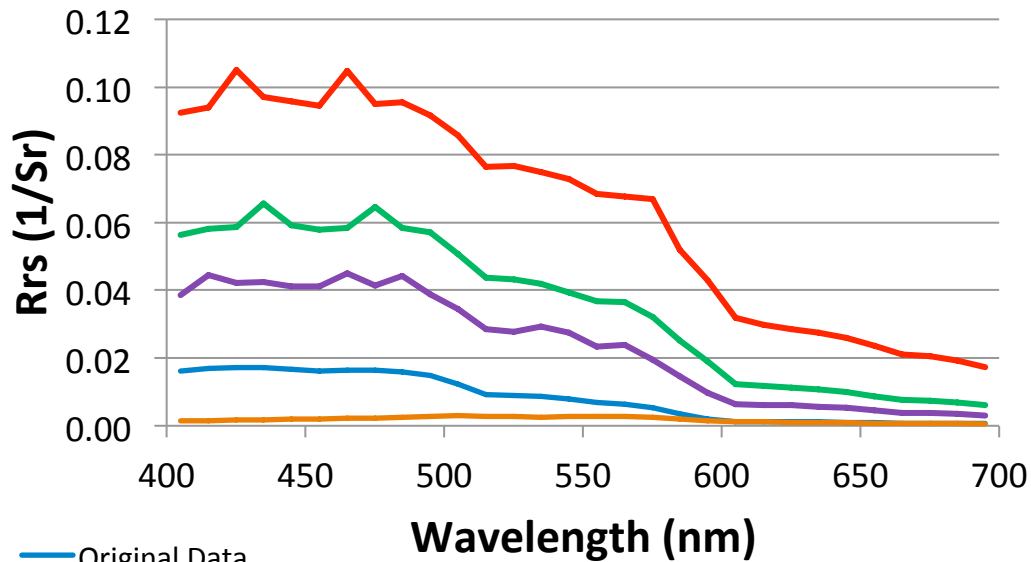
Klu (550 nm) vs. depth – upwelled radiance



Kd (550 nm) vs. depth – downwelled irradiance



- Influence of the bottom reflectance on two K functions
- White coral sand bottom



- Original Data
- Edited Data (Data Removal)
- Original Using 0.3 Bb
- Original Using 0.1 Bb
- Original Using 0.05 Bb

Q5 - hydrolight support user

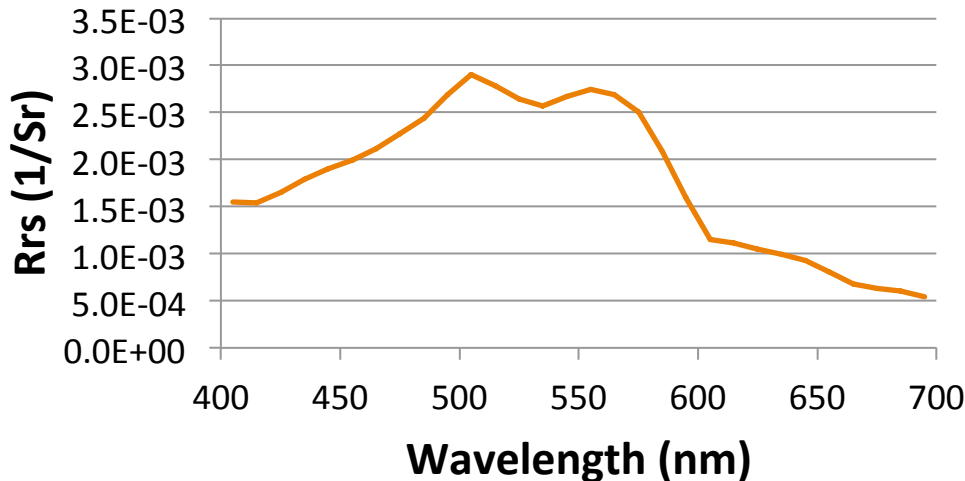
complain of a customer

2 hypotheses: Problems caused by wrong backscatter number or data input

Backscatter changes don't appear to help drop the hydrolight curve

Editing out the anomalous data line appears to create the desired shape

Edited Data (Data Removal)



0.5100	0.36810	0.27890	0.17780	0.13410	0.14940
0.5600	0.48890	0.38730	0.40810	0.07060	0.09100
0.6700	0.38360	0.28310	0.18360	0.14350	0.15710
0.7500	0.39390	0.29180	0.19080	0.14790	0.16040
0.7800	6.81930	65.06860	50.20810	75.32900	18.14110
0.7900	0.38550	0.28990	0.18630	0.14600	0.15940
0.8400	0.38580	0.28960	0.18970	0.15010	0.16070
0.8600	0.38500	0.30910	0.19050	0.15220	0.16260
0.8900	0.38910	0.29590	0.19130	0.15110	0.16350
0.9100	0.38450	0.29350	0.18810	0.14660	0.15890
0.9700	0.38600	0.28640	0.18560	0.14450	0.15830
1.0200	0.38960	0.29340	0.18880	0.14510	0.15710
1.0300	0.39150	0.30200	0.20380	0.15360	0.16520
1.1300	0.39110	0.29520	0.19550	0.15210	0.16130
1.2400	0.39320	0.29350	0.19080	0.14850	0.16260
1.2700	0.38650	0.28710	0.18880	0.14810	0.15970
1.3200	0.38110	0.28320	0.18590	0.14420	0.15480