MODIS Data Product Status Numbers 19, 23, & 26

Dennis K Clark

18 December 2001

MODIS Terra-Product Status

- Product 19
  - Parameter 13 - CZCS_pigment
    - (Chl *a* +Phaeo) Fl determined
  - Parameter 14 - chlor_MODIS
    - (Chl *a* (monovinyl and divinyl), Chl *a* allomer, Chl *a* epimer, and chlorophyllide *a*) - HPLC determined
  - Parameter 15 - pigment_c1_total
    - (Chl *a* + 27 Accessory Pigments) - HPLC determined

Product Status cont’d

- Product 23
  - Parameter 19 - Total Suspended Matter
    - Dry Weight
- Product 26
  - Parameter 23 - K_490
  - SeaWiFS - Downwelled Irradiance Diffuse Attenuation Coefficient

Computational Forms

- Products 19 and 23
  - Least Squares Regressions (Log, Log)
  - 3rd order polynomials
  - $R^2 > 0.91$ $S_{yx} \sim .045$
- Product 26
  - Least Squares Regression
  - Linear
  - $R^2 = 0.94$ $S_{yx} = 0.167$

Generalized form for product computation

Log Product = A(Log X)3 + B(Log X)2 + C(Log X) + D) / E

Where:

A,B,C,D are least squares regression coefficients,

E is a constant for offsetting the derived relationship (presently set to 1),

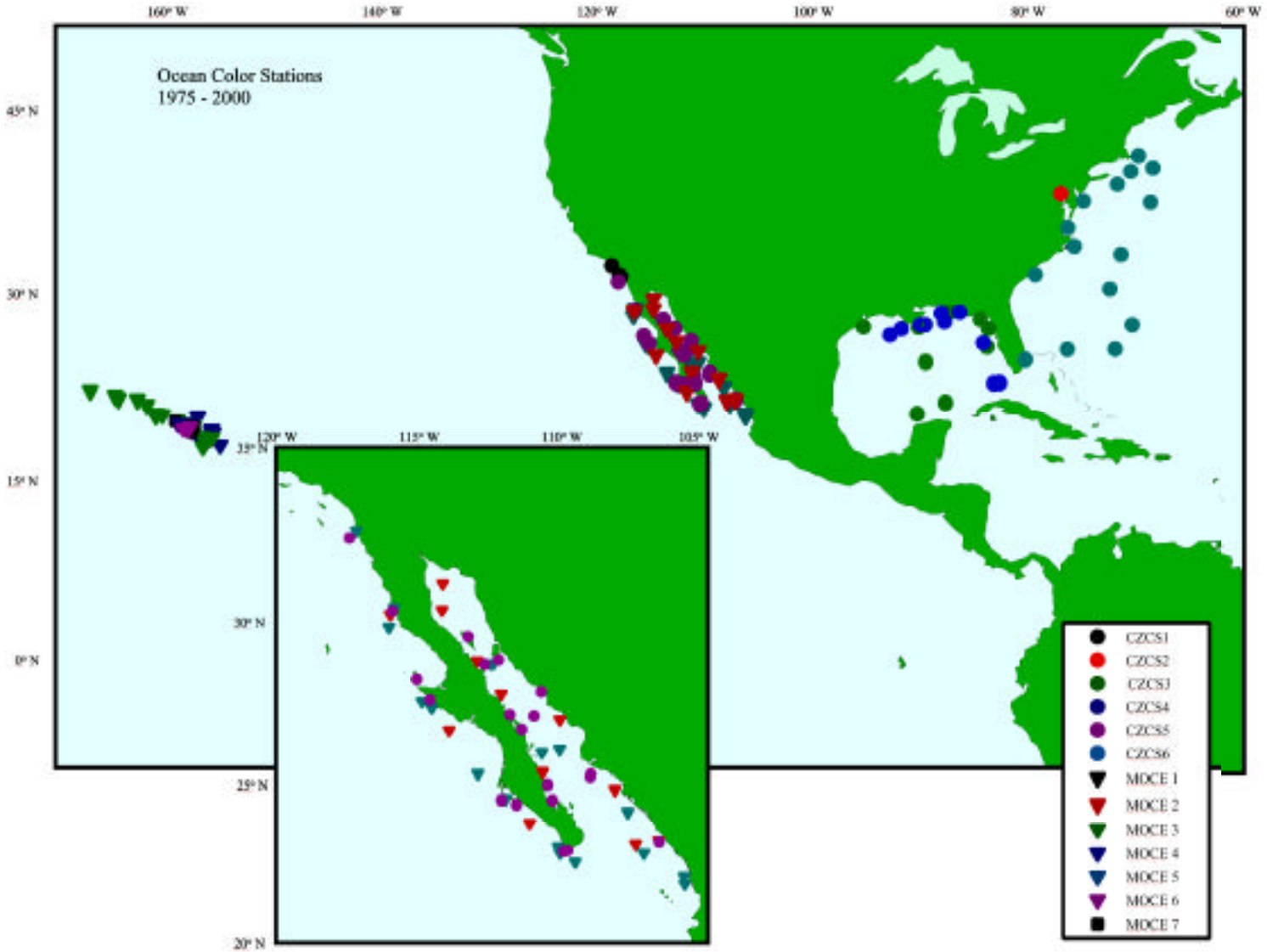
X = [(e) nLw (band 9) + (f) nLw (band 10) + (g) nLw (band 11)] / nLw (band 12),

The wavelength bands 9, 10, 11, & 12 are centered at 442, 487, 530, & 547 nm, respectively.

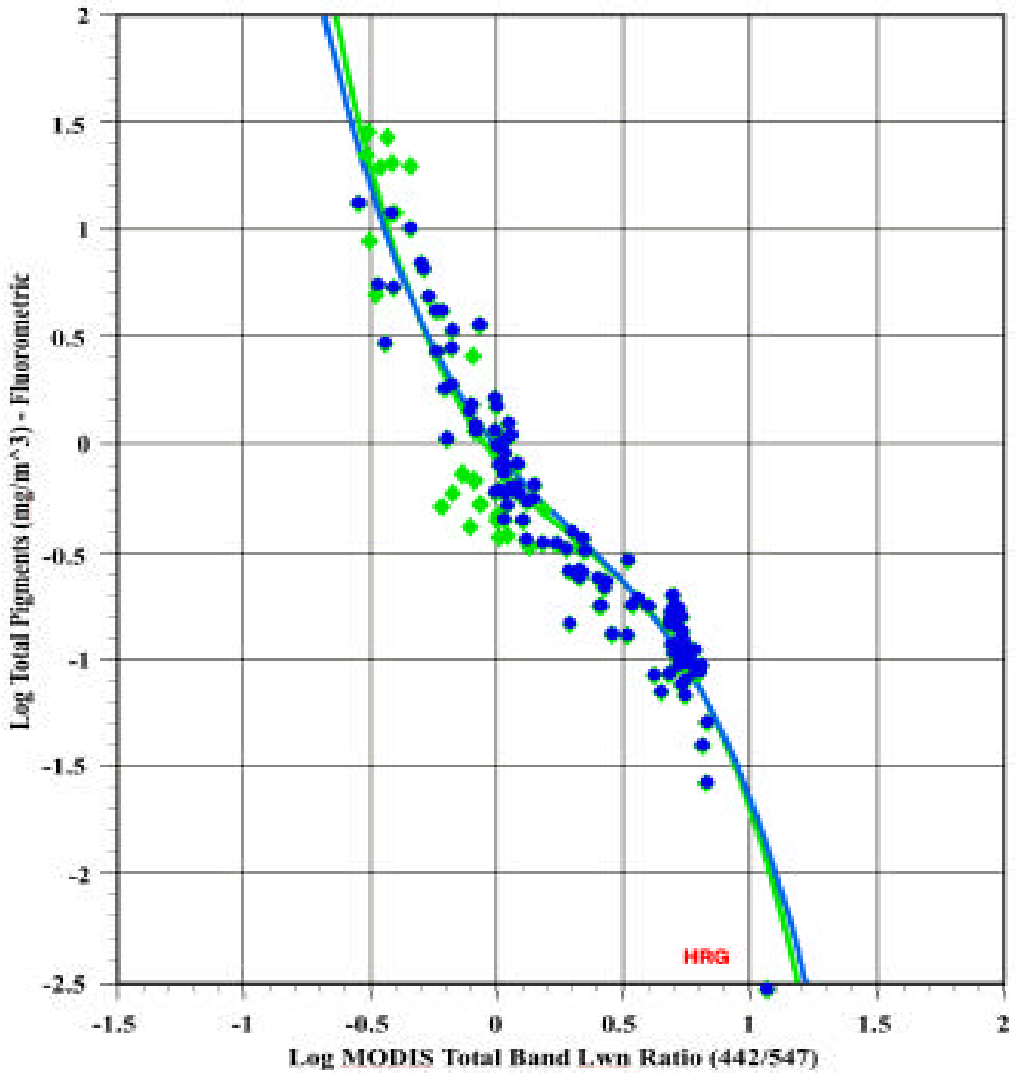
e, f, and g are set to zero or one to select band combinations,

nLw = MODIS total band solar normalized water-leaving radiance.

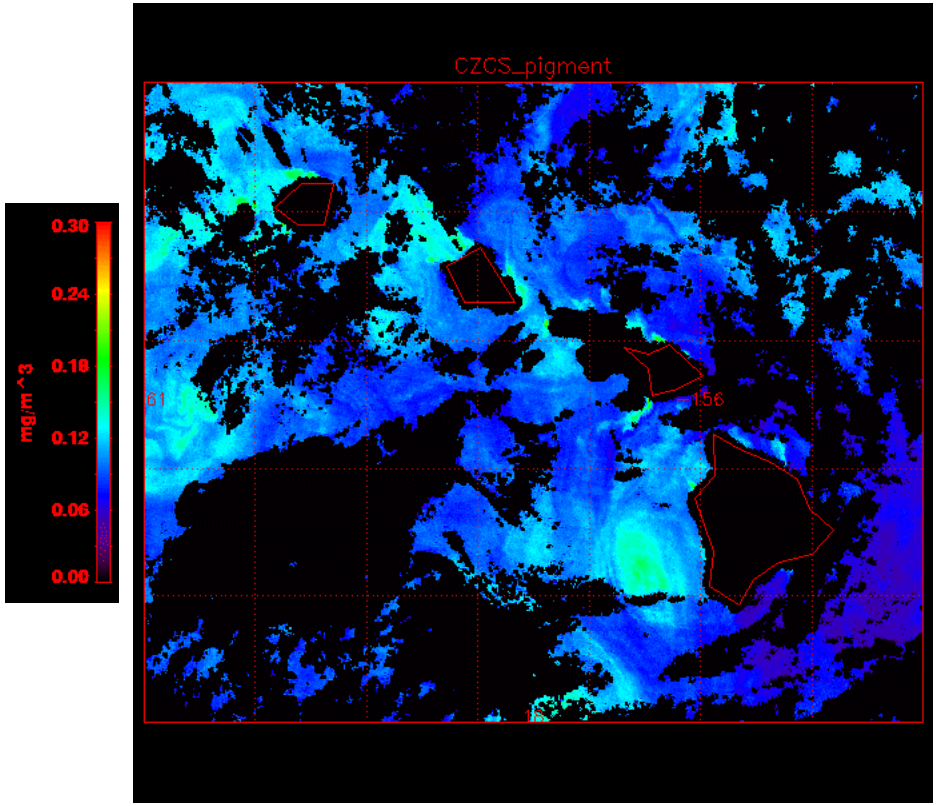
Station location map for the observations used in development of these products.

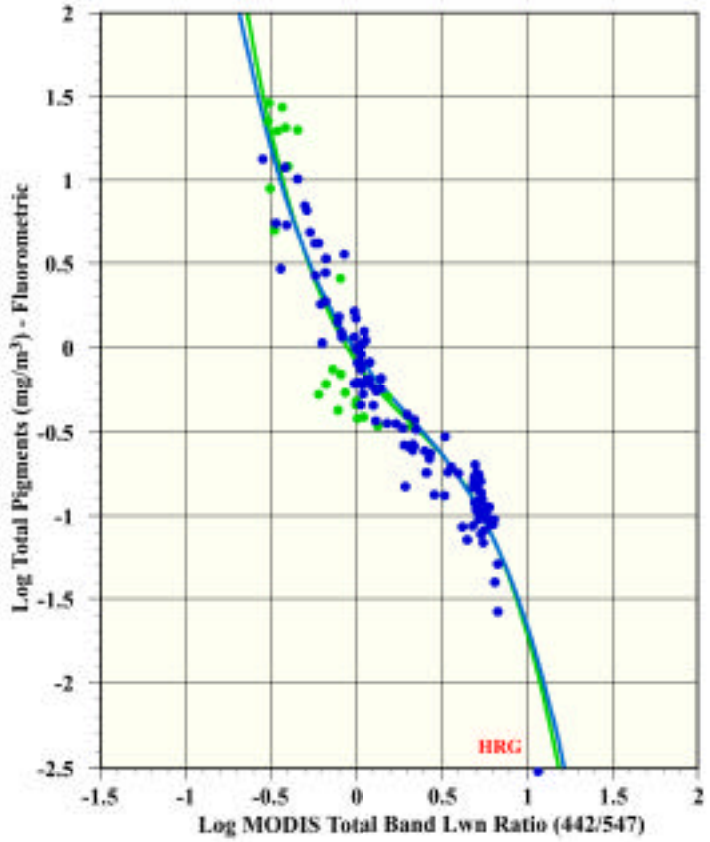


CZCS_pigment - MODIS total band normalized water-leaving radiance ratios vs fluorometrically determined pigment concentrations (mg/m3) with regression lines for case 1 waters (blue) and case 1 & 2 (green) waters.



Product Number - MOD 19
Parameter 13, CZCS_pigment
Day 345, 2000

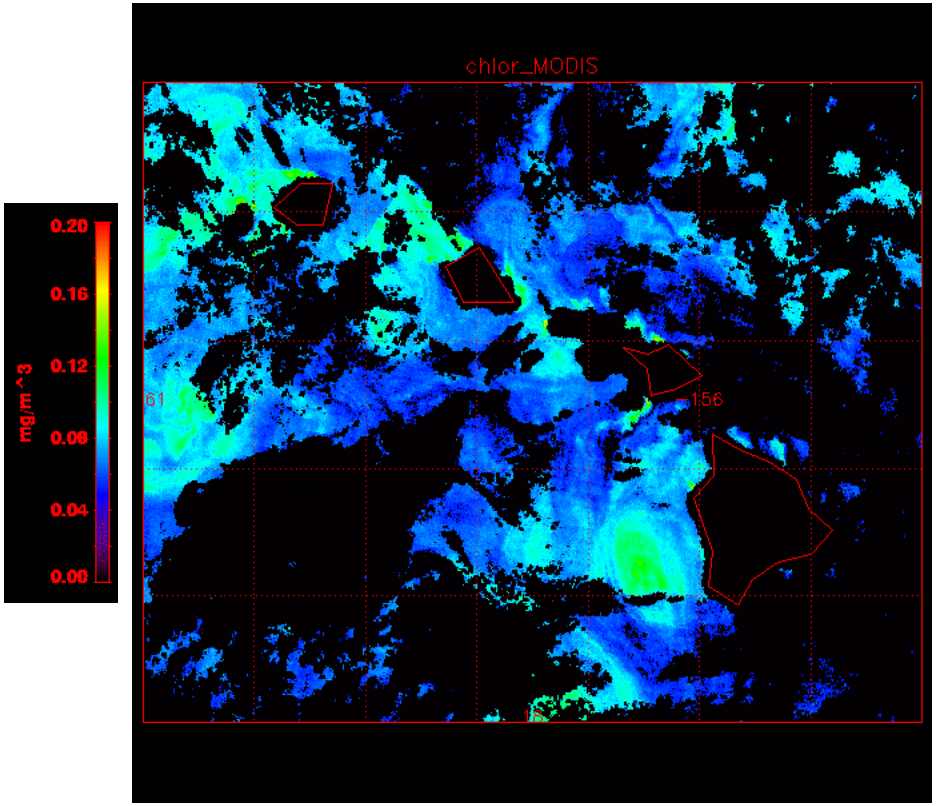


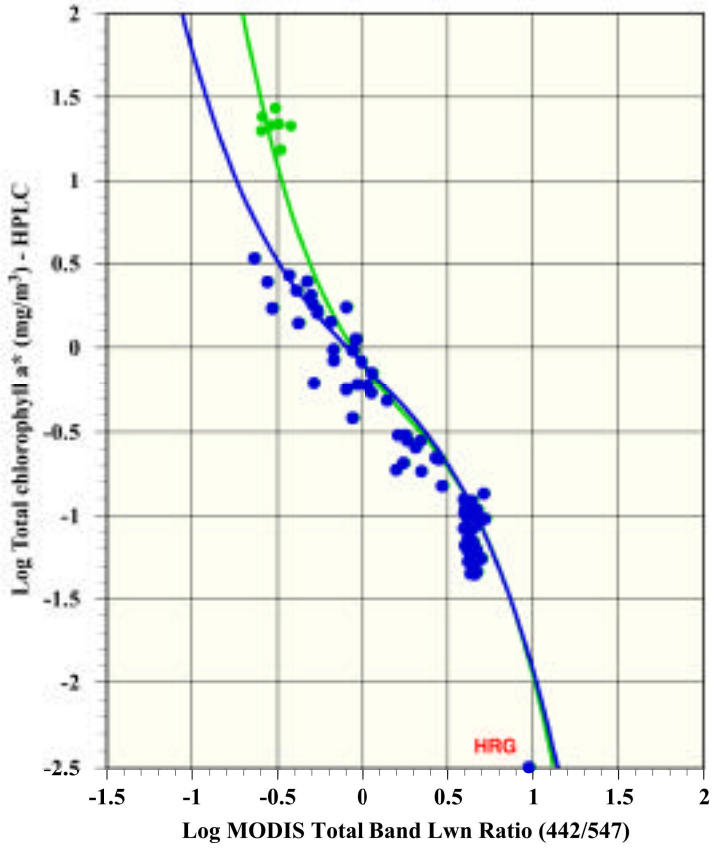


f(x) = -1.742E+0*x^3 + 1.625E+0*x^2 + -1.495E+0*x + -7.938E-2
R0^2 = 9.116E-1

f(x) = -1.338E+0*x^3 + 1.213E+0*x^2 + -1.497E+0*x + -2.273E-2
R0^2 = 9.207E-1

Product Number - MOD 19
Parameter 14, chlor_MODIS
Day 345, 2000

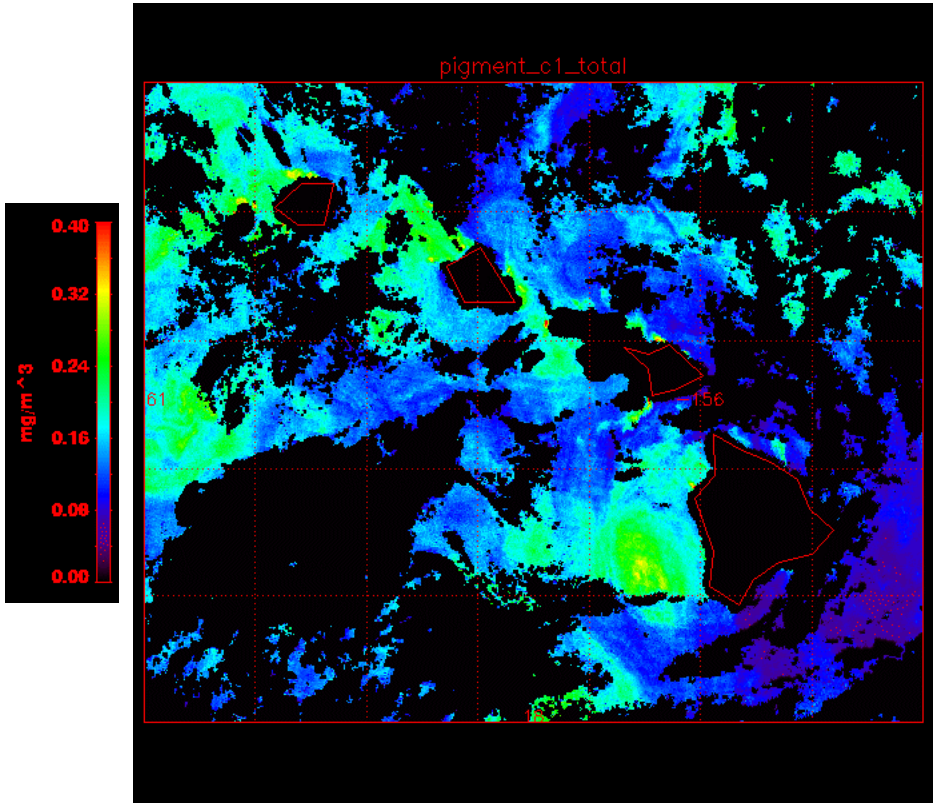


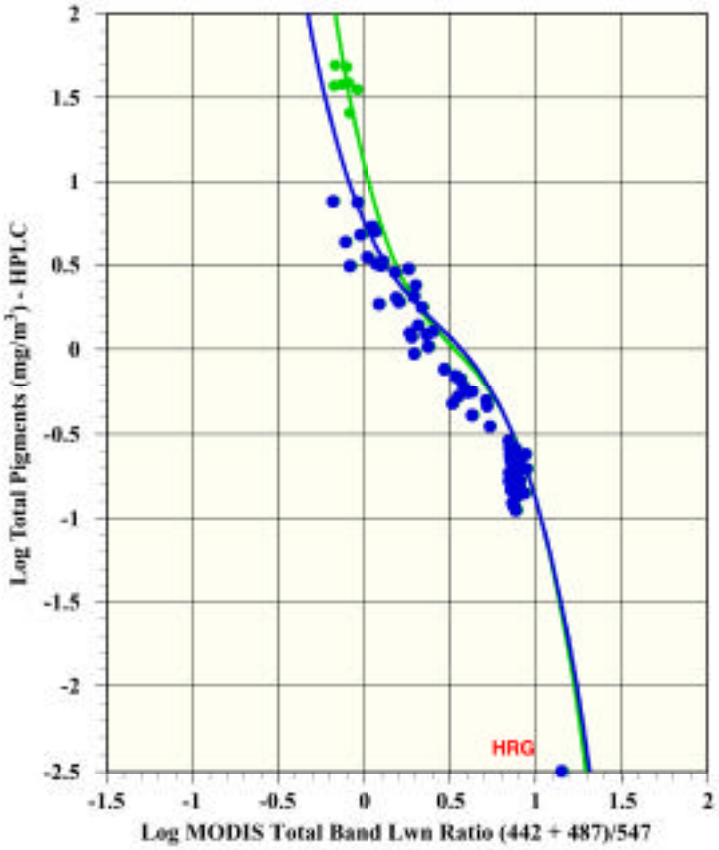


f(x) = -1.594E+0*x^3 + 1.122E+0*x^2 + -1.396E+0*x + -9.221E-2
R0^2 = 9.153E-1

f(x) = -8.622E-1*x^3 + 1.953E-2*x^2 + -9.883E-1*x + -9.318E-2
R0^2 = 9.361E-1

Product Number - MOD 19
Parameter 15, pigment_cl_total
Day 345, 2000

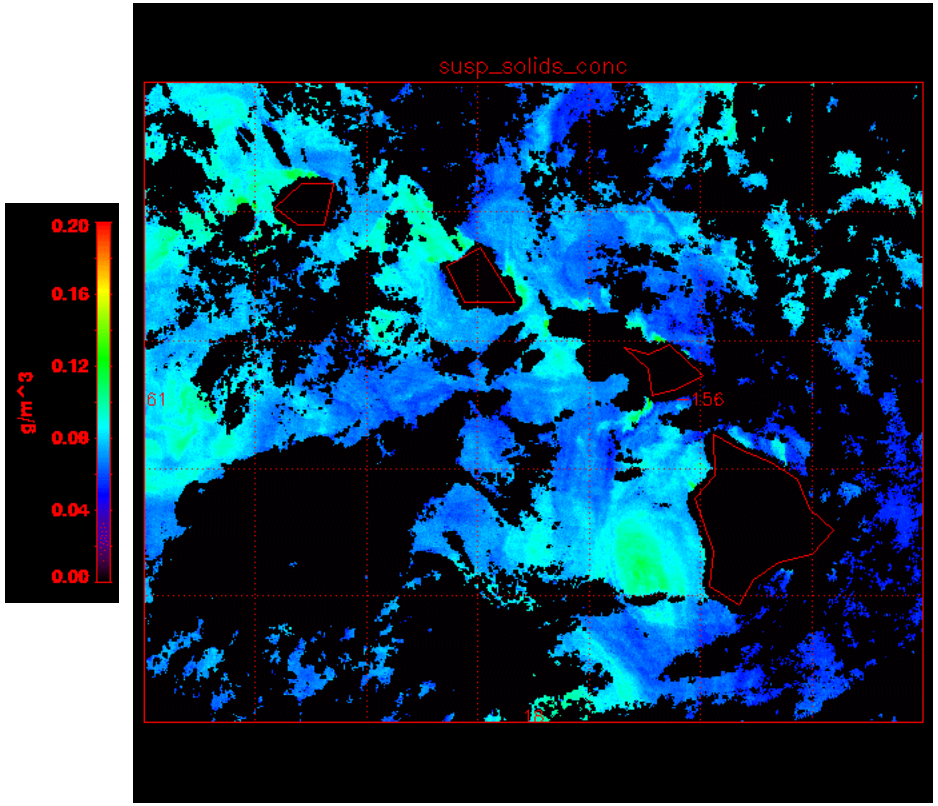


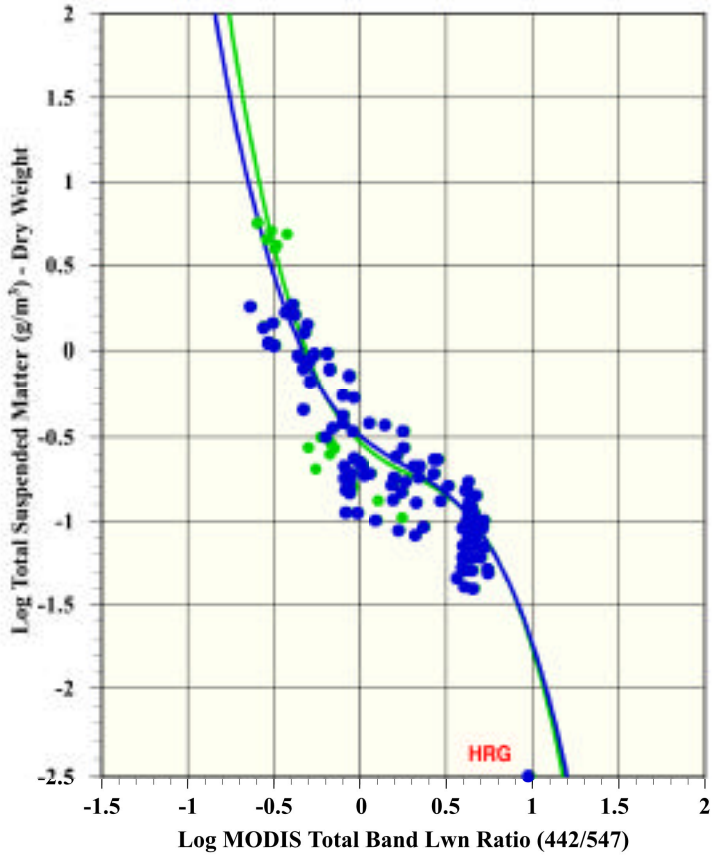


f(x) = -3.848E+0*x^3 + 6.106E+0*x^2 + -4.250E+0*x + 1.109E+0
R0^2 = 9.341E-1

f(x) = -2.550E+0*x^3 + 3.292E+0*x^2 + -2.393E+0*x + 7.644E-1
R0^2 = 9.396E-1

Product Number - MOD 23
Parameter 19,Total Suspended Matter
Day 345, 2000

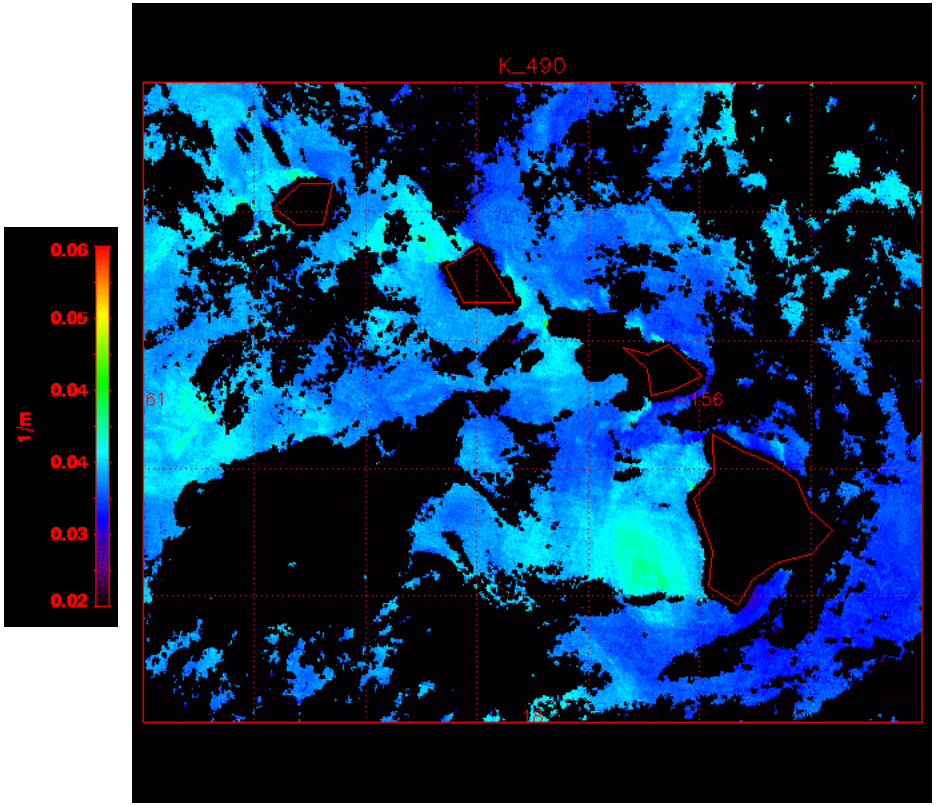


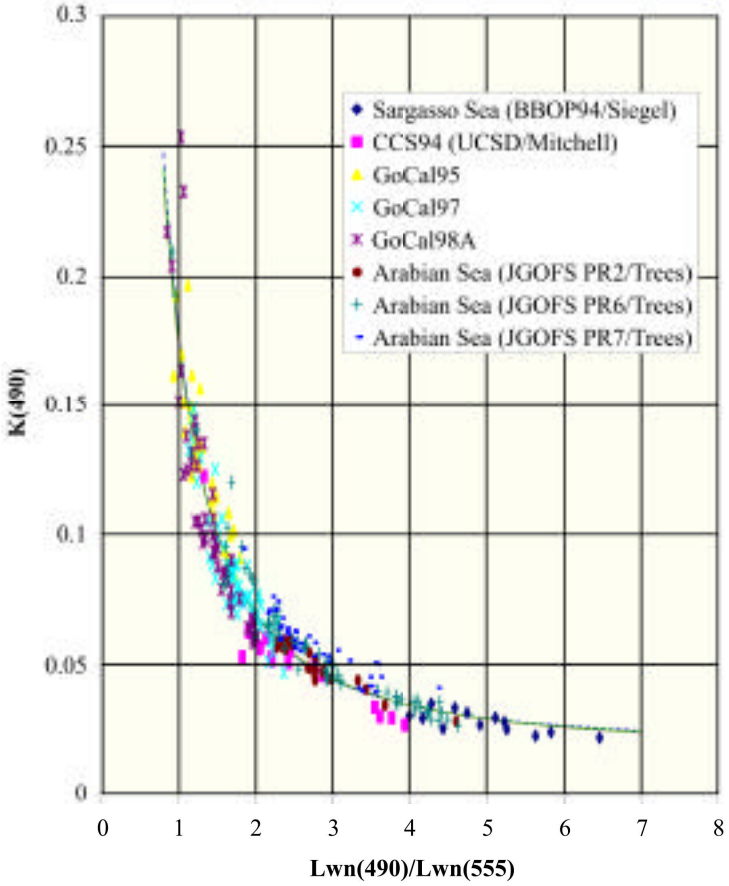


f(x) = -1.902E+0*x^3 + 1.659E+0*x^2 + -9.883E-1*x + -5.307E-1
R0^2 = 8.309E-1

f(x) = -1.513E+0*x^3 + 1.170E+0*x^2 + -9.002E-1*x + -4.901E-1
R0^2 = 7.977E-1

Product Number - MOD 26
Parameter 23,K_490 Diffuse Coefficient
Day 345, 2000

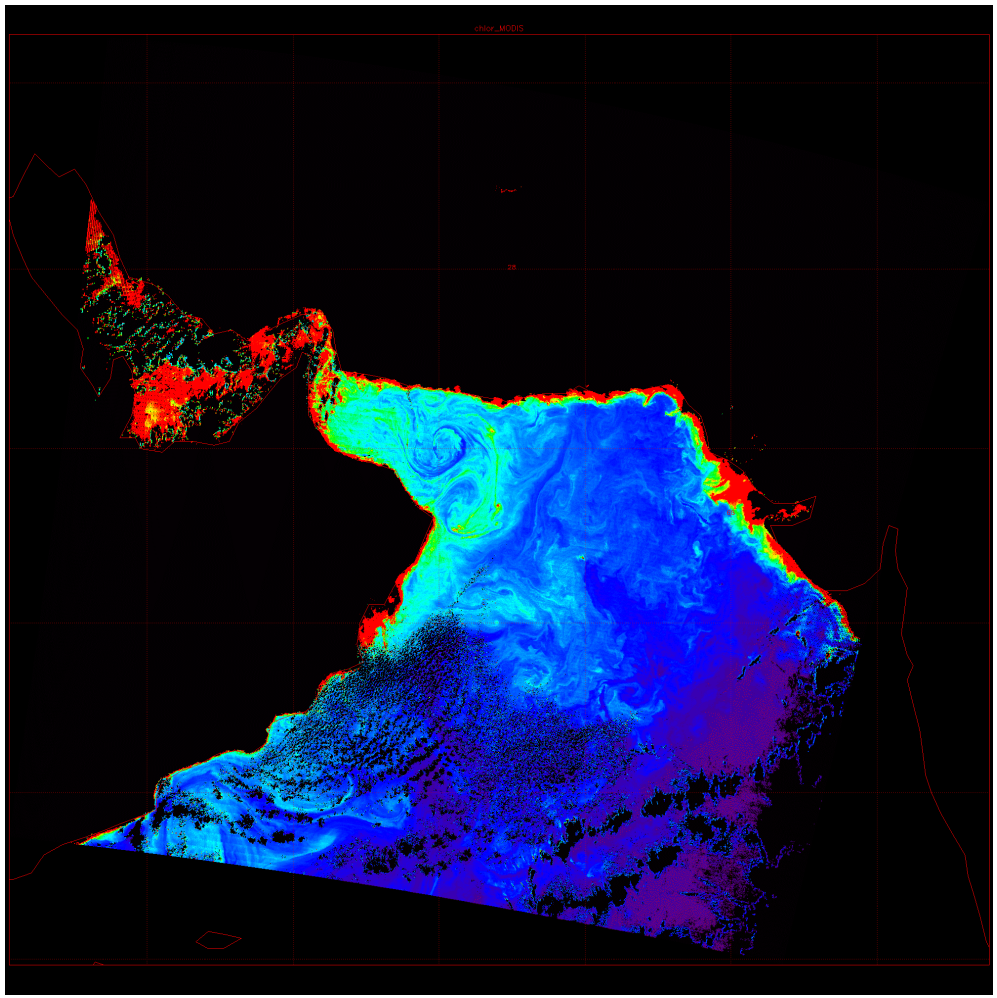




$$K_{Ed}(490) = 0.016 + 0.15645\left[\frac{nL_w(488)}{nL_w(547)}\right]^{-1.5401}$$

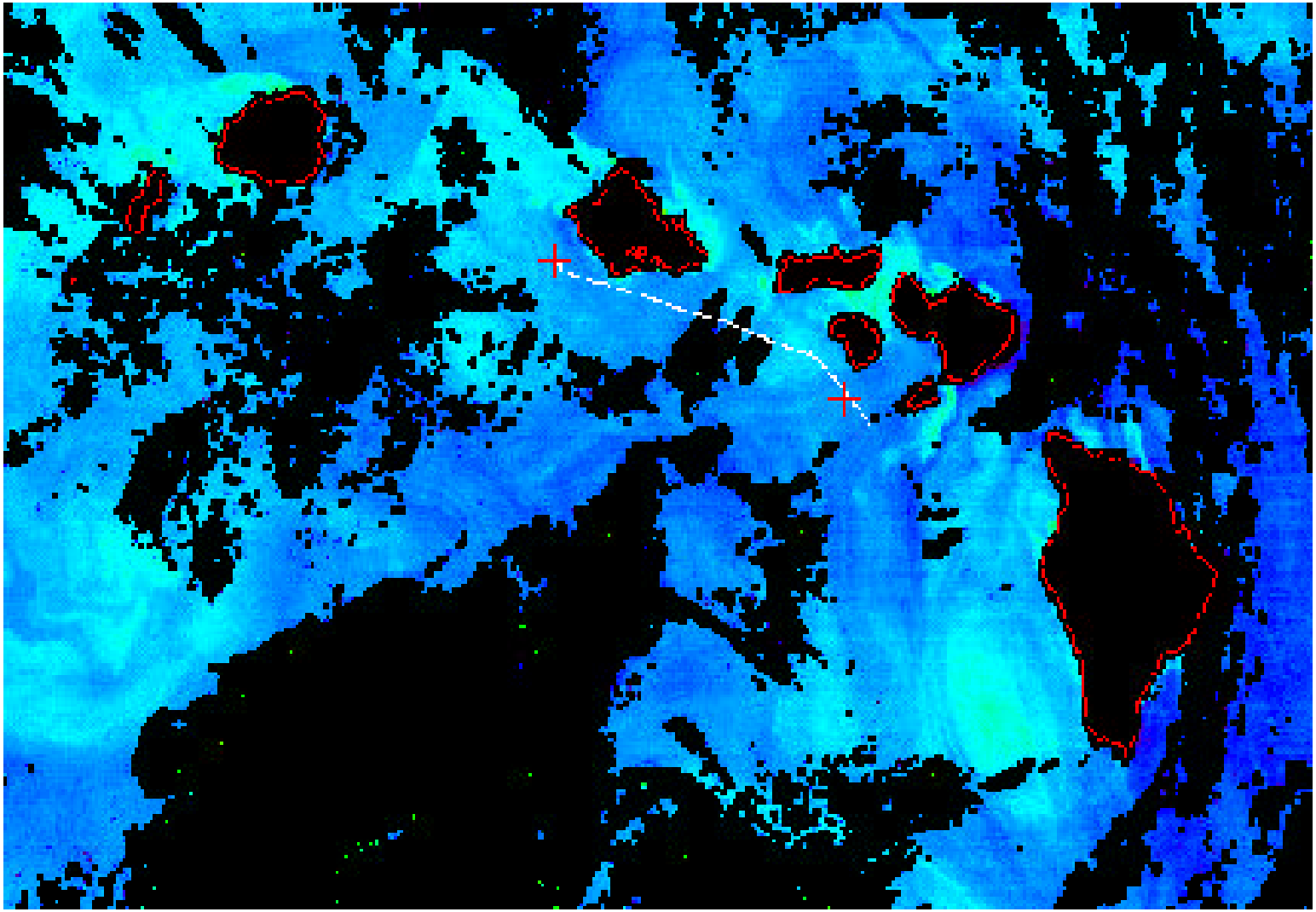
R0^2 = 9.4E-1

Product Number - MOD 19
Parameter 14, Chlor_MODIS
Arabian Sea Dec. Chl (Day 336, 2000)

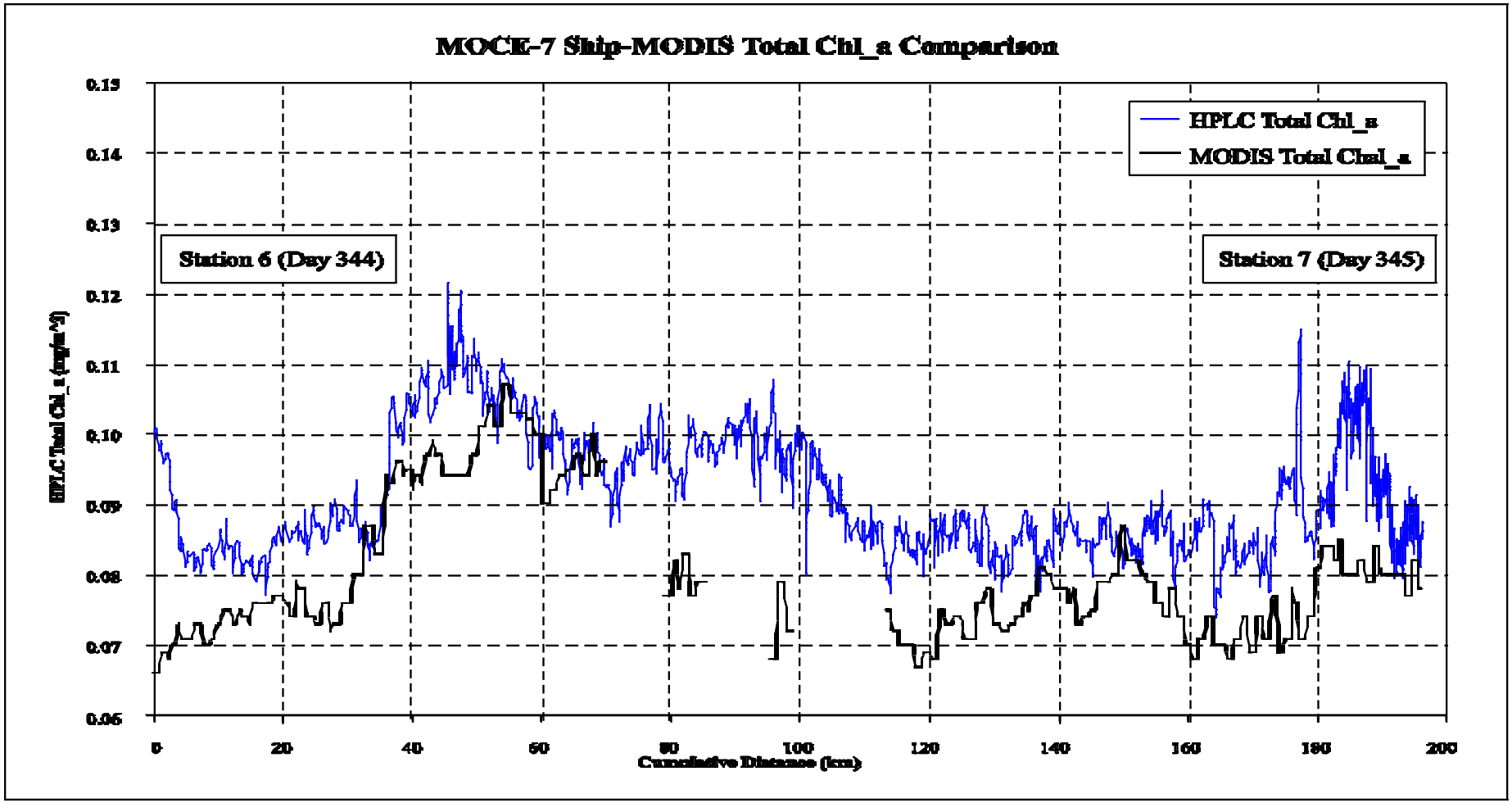


MODIS Day 345 -Ship Track

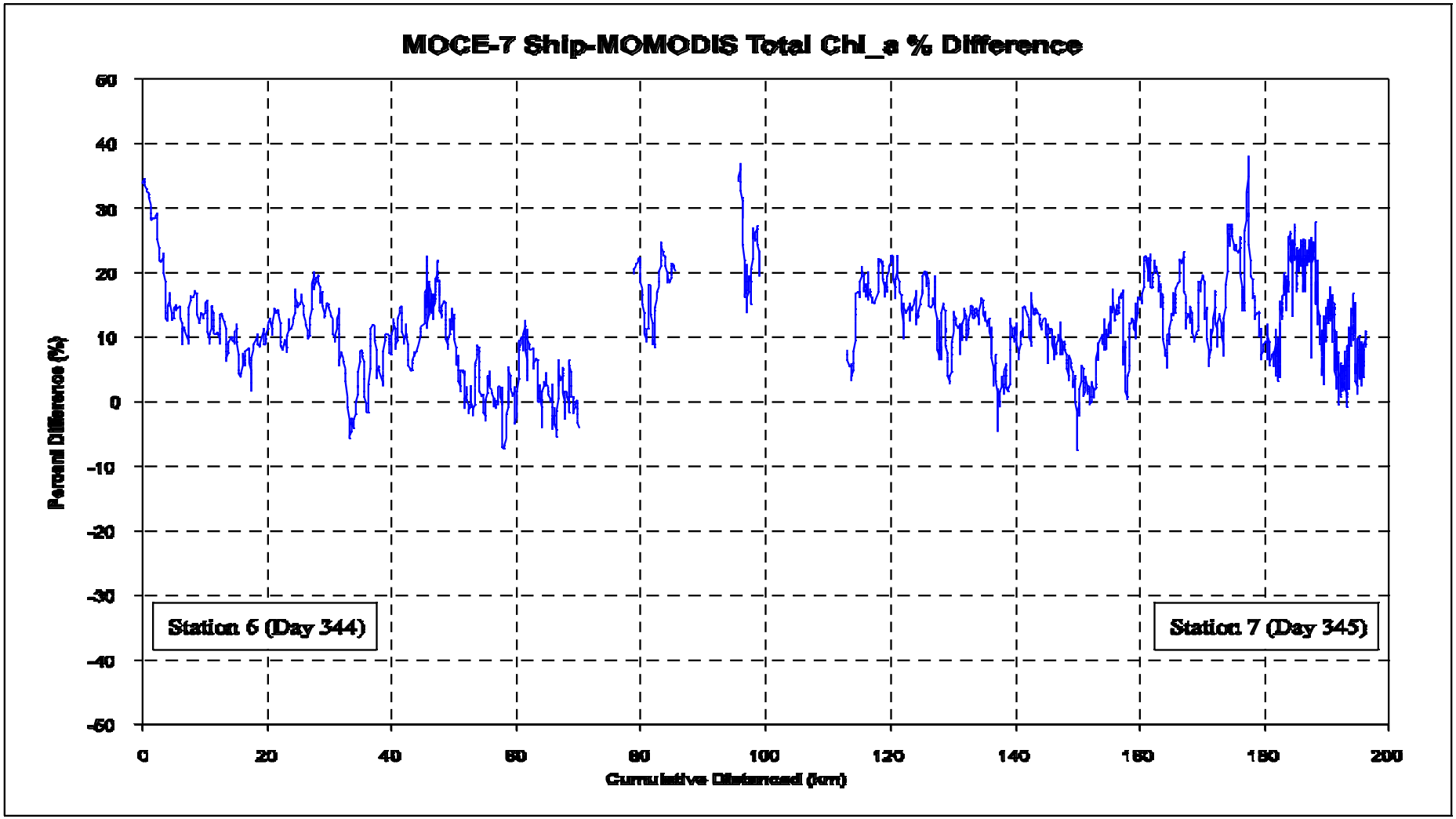
Station 7 Station 6



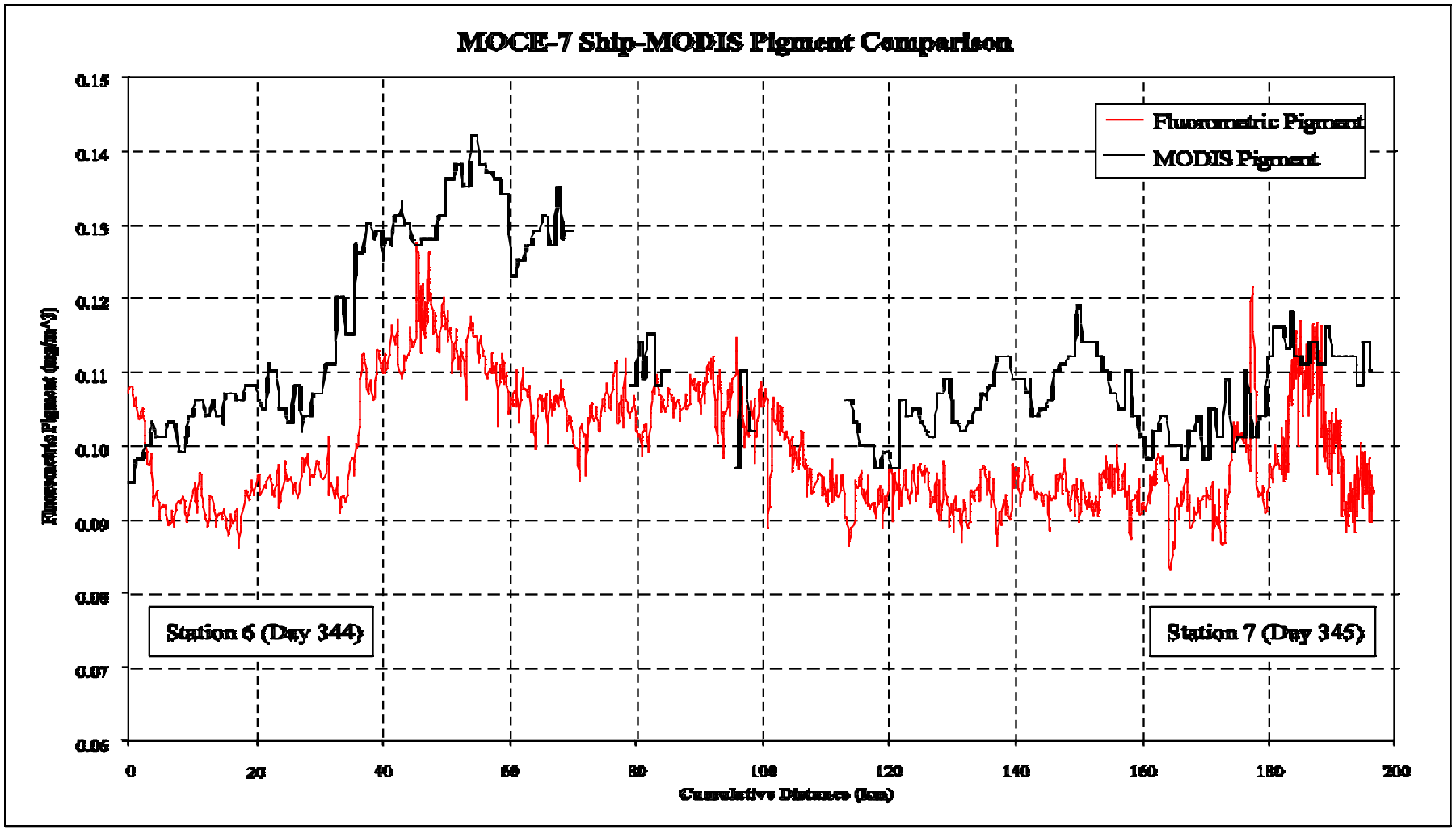
MODIS_CHL Retrievals - MOCE -7 along track Total chl a



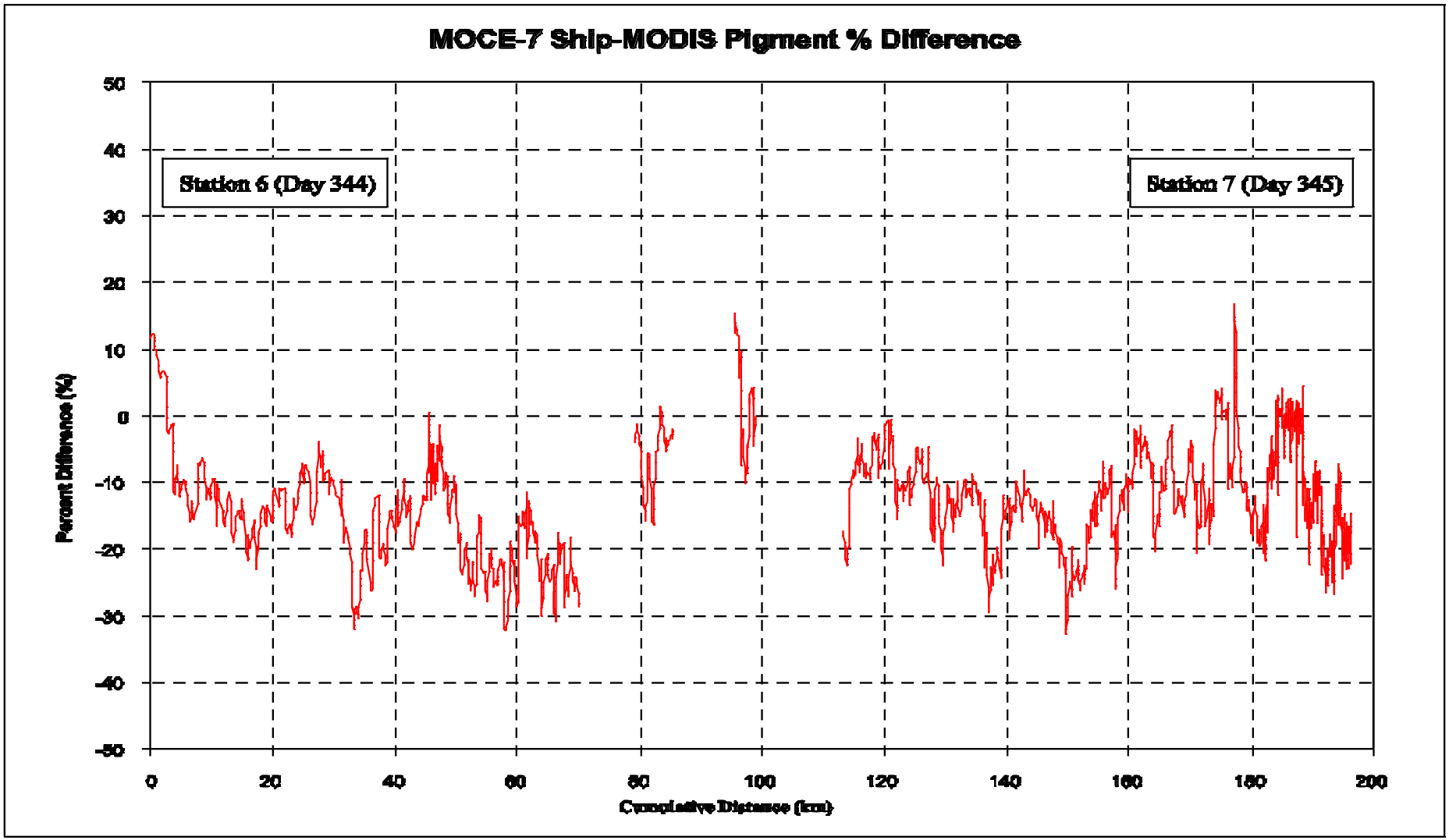
Percent Difference



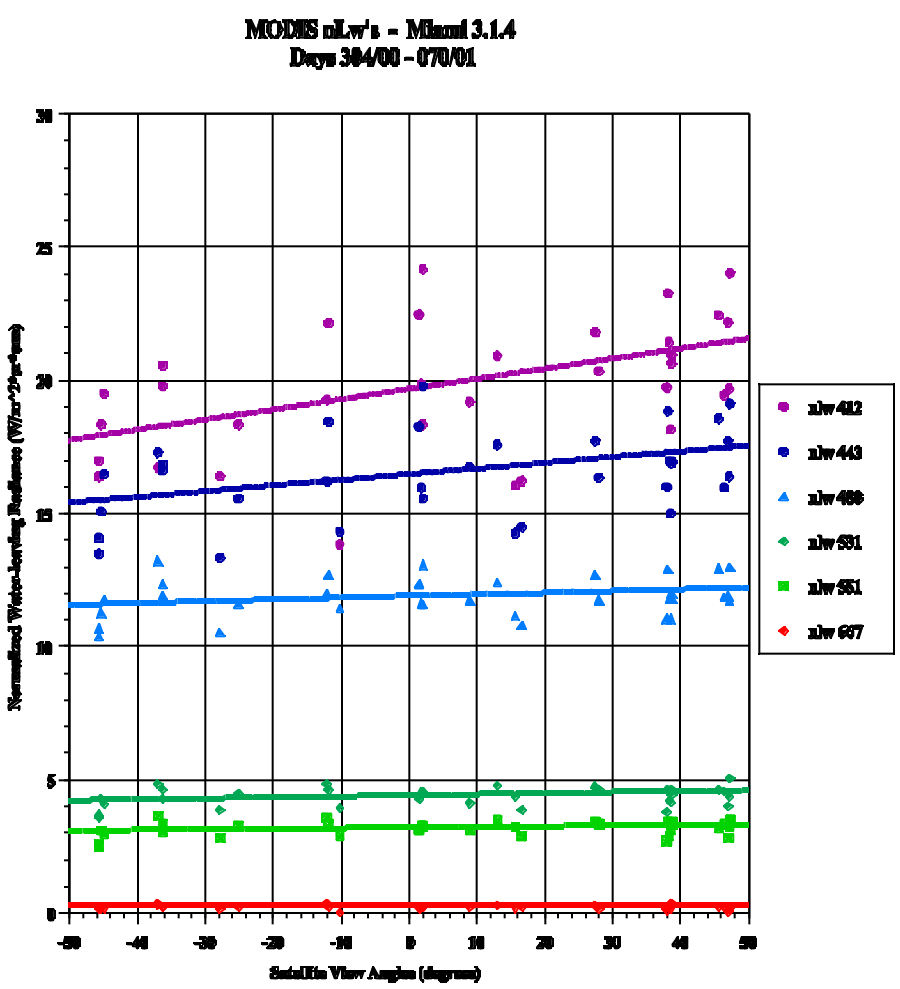
MODIS CZCS_pigment - MOCE-7 along-track pigments

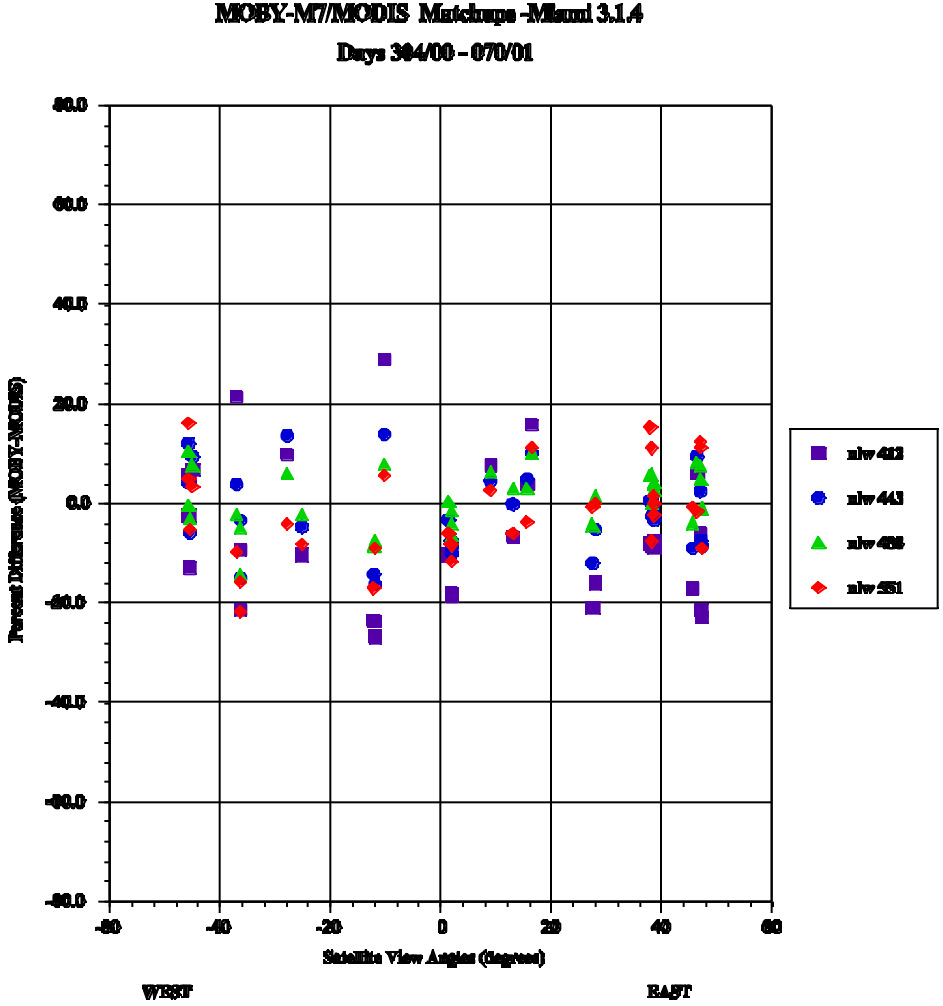


Percent Difference



Calibration State Version 3.1.4





Present Status - Future Validation

- Present products invalid with the exception of ~ 2-3 weeks in December 2000
- Recent Miami calibration results solve most of the major nLw problems
- These products could be validated within 30 days once the nLw's are considered validated.