



Geological Survey of Canada Open File # 4981

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Vitrinite reflectance data  
for  
Eastcan *et al* Herjolf M-92

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M. P. Avery

**2005**



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**Canada**

# GEOLOGICAL SURVEY OF CANADA

## OPEN FILE 4981

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Vitrinite reflectance data  
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Eastcan et al Herjolf M-92

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M. P. Avery  
Marine Resources Geoscience Subdivision  
Geological Survey of Canada (Atlantic), Dartmouth

2005

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### Well information

**G.S.C. Locality No.:** D166    **Unique Well ID:** 300 M92 55400 57300    **Location:** 55.53147 °N, 57.747925°W

**R.T. Elevation:** 26.8 (87.9')    **Water Depth:** 139.0 (456')    **Total Depth:** 4086.1 (13405.7')

**Sampled Interval:** 457.2 - 4084.3 (1500 - 13400')    **Interval Studied:** 502.9-4020.3 (1650-13190')

**Depth Units:** Metres (originally recorded in feet) referenced to R.T.

**Rig Release Date:** November 23, 1976

### Introduction

Vitrinite reflectance has been determined on 33 rotary cutting samples from Eastcan *et al* Herjolf M-92, which was classified as an exploratory well located in the Hopedale Basin on the northern Labrador Shelf. Well status is Plugged and Abandoned.

Sample preparation followed the procedures listed in Appendix I. Data acquisition and manipulation was done on a Zeiss Photometer III system with a custom interface to a computer for data storage and statistical summaries.

Analysis of the well reveals thermal maturity levels given in Table I. Specific maturity levels, as set out in this report, are based on those of Snowdon and Powell (1984) with modified terminology (Appendix II).

Table I  
**Inferred Hydrocarbon Thermal Maturity Levels**

Depth in metres	Vitrinite Reflectance* %Ro	Hydrocarbon generation levels** for type II or III kerogen	Maturity slope used to calculate depths
139[sea floor]	(0.21)	immature	upper
790	0.3	immature	upper
1340	0.4	immature approaching maturity	upper
1760	0.5	marginally mature	upper
2100	0.6	onset of significant oil generation	upper
4080	0.8	peak maturity	lower
4086.1[T.D.]	(.80)	peak maturity	lower

\*()'s indicate Ro's extrapolated from linear regression slopes: upper 0.229 log Ro/km; lower 0.062 log Ro/km

\*\*Actual hydrocarbon products depend on type of organic matter present (Snowdon and Powell, 1984).

### Remarks

Sample coverage for vitrinite reflectance analysis (Figure 1, Table II) was reasonably complete over the section penetrated below 502.9 m at Herjolf M-92. The data were plotted on a log Ro vs. linear depth scale. An initial plot of the data indicated that the maturity profile would be best represented by separate upper and lower slopes. Regression lines fitted through the data yielded maturity slopes of 0.229 and 0.062 log Ro/km respectively. Because there is a significant variation in the number of readings from one sample point to another (Table II) the regression line was weighted based on the 'n' value for each point. The relative size of the point symbols provide an indication of the number of readings. The 'error bars' displayed on the maturity profile indicate one standard deviation on either side of the mean and may be deceptively small for samples with very few readings.

The histogram display (Figure 2) shows the variability in the reflectance populations, which represent the maturity of the sediments with depth. Plotting reflectance histograms on a log scale may help reveal any trends present in the Ro data. It also can help to demonstrate the effects of cavings, geology, casing points and other influences on the vitrinite reflectance populations.

These vitrinite reflectance data show that the thermal maturity of the lower section of Herjolf M-92 is suitable to generate and preserve hydrocarbons within the drilled section, between 1760 and 4086.1 m (T.D.), provided potential source rocks of the proper organic matter type and traps are present.

## **Method**

Data obtained for this report were measured on polished whole rock mounts and kerogen isolate mounts. Whole rock mounts preserve, for the most part, the association of the organic matter with the mineral matrix while a kerogen isolate is a concentration of organic matter with most of the mineral matrix removed. A discussion of the merits of both methods is beyond the scope of this report but is discussed by Barker (1996, p. 251-256). It is interesting to note that in this well, values of kerogen mounts are generally higher than the whole rock in the upper maturity slope but are coincidental in the lower slope. (Table II, Figure 1). Whole rock sample labels have the prefix letter 'C' while kerogen sample labels have prefix letter 'K'.

## **Discussion**

There is a considerable amount of scatter in the data around the upper slope line. This maybe attributable to the significant amount of reworked or recycled vitrinites in this section. This is evident from the presence of coaly (trimacerite and bimacerite) particles in these samples. This may also account somewhat for the different trends for kerogen and whole rock in this section. It could be that reworked particles are easier to identify in the whole rock mounts. Similar to several other recently run wells in the Labrador Sea area the top two points have very low reflectance values. Also the maturity profile seems to contain more than one trend or slope in the dataset similar to Labrador Sea/Davis Strait wells Hekja O-72 and Gjoa G-37.

## **References**

- Barker, C. E.  
 1996: A comparison of vitrinite reflectance measurements made on whole-rock and dispersed organic matter concentrate mounts. *Organic Geochemistry*, v. 24, p. 251-256.
- Powell, T. G. and Snowdon, L. R.  
 1983: A composite hydrocarbon generation model. *Erdöl und Kohle, Erdgas, Petrochemie*, v. 36, p. 163-170.

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MResG Files, Dartmouth	C. Beaumont, Dalhousie Univ., Halifax

Table II

**Summary of whole rock and kerogen - based vitrinite reflectance**

Sample* Labels	Depth in metres (original units: feet)	Mean Ro (SD) non-rotated	Number of Readings	
			Total	Edited
C842-04	502.9 (1650)	0.21 ( $\pm 0.03$ )	17	17
C843-04	539.5 (1770)	0.24 ( $\pm 0.03$ )	9	9
C844-04	768.1 (2520)	0.31 ( $\pm 0.04$ )	14	14
K0241A	862.6 (2830)	0.37 ( $\pm 0.03$ )	13	11
C845-04	914.4 (3000)	0.33 ( $\pm 0.03$ )	13	10
C846-04	996.7 (3270)	0.33 ( $\pm 0.04$ )	16	16
C847-04	1060.7 (3480)	0.34 ( $\pm 0.04$ )	13	13
K0241B	1106.4 (3630)	0.38 ( $\pm 0.04$ )	21	21
C848-04	1152.1 (3780)	0.40 ( $\pm 0.06$ )	8	4
C849-04	1207.0 (3960)	0.36 ( $\pm 0.04$ )	12	12
K0241C	1228.3 (4030)	0.40 ( $\pm 0.04$ )	17	17
C850-04	1362.5 (4470)	0.35 ( $\pm 0.03$ )	3	3
K0242A	1380.7 (4530)	0.47 ( $\pm 0.03$ )	16	12
C851-04	1517.9 (4980)	0.41 ( $\pm 0.03$ )	7	5
K0242B	1624.6 (5330)	0.50 ( $\pm 0.03$ )	24	24
K0242C	1746.5 (5730)	0.52 ( $\pm 0.03$ )	17	14
K0243A	1837.9 (6030)	0.56 ( $\pm 0.05$ )	18	16
C853-04	1837.9 (6030)	0.44 ( $\pm 0.03$ )	16	13
K0243B	1959.9 (6430)	0.57 ( $\pm 0.05$ )	19	19
K0243C	2051.3 (6730)	0.58 ( $\pm 0.07$ )	21	21
C855-04	2127.5 (6980)	0.47 ( $\pm 0.05$ )	11	11
K0244A	2417.1 (7930)	0.57 ( $\pm 0.05$ )	19	19
K0244B	2569.5 (8430)	0.67 ( $\pm 0.05$ )	8	6
K0244C	2630.4 (8630)	0.67 ( $\pm 0.10$ )	16	16
K0245A	2752.3 (9030)	0.69 ( $\pm 0.07$ )	23	22
C858-04	2923.0 (9590)	0.69 ( $\pm 0.08$ )	18	18
C859-04	3078.5 (10100)	0.73 ( $\pm 0.06$ )	17	16
C860-04	3343.7 (10970)	0.71 ( $\pm 0.05$ )	20	19
C861-04	3508.2 (11510)	0.72 ( $\pm 0.07$ )	33	31
K0245B	3575.3 (11730)	0.77 ( $\pm 0.06$ )	37	37
C863-04	3654.6 (11990)	0.73 ( $\pm 0.06$ )	35	35
C864-04	3764.3 (12350)	0.77 ( $\pm 0.07$ )	34	34
C865-04	4020.3 (13190)	0.77 ( $\pm 0.06$ )	28	14

\*Sample labels prefixes: 'C' indicates whole rock stubs prepared at GSC - Calgary and 'K' indicates kerogen stubs prepared at GSC - Atlantic

Table III  
**Formation Tops (Moir, pers. comm.)**

Formation	Depth in metres
Saglek	239.5
Mokami	773.5
Kenamu	1398
Cartwright	1963
Gudrid Fm	2127-2130
Markland	2211
Bjarni	2592
Snorri Mb	2592-2615
Alexis	3751
(precambrian Granodiorite)	4048

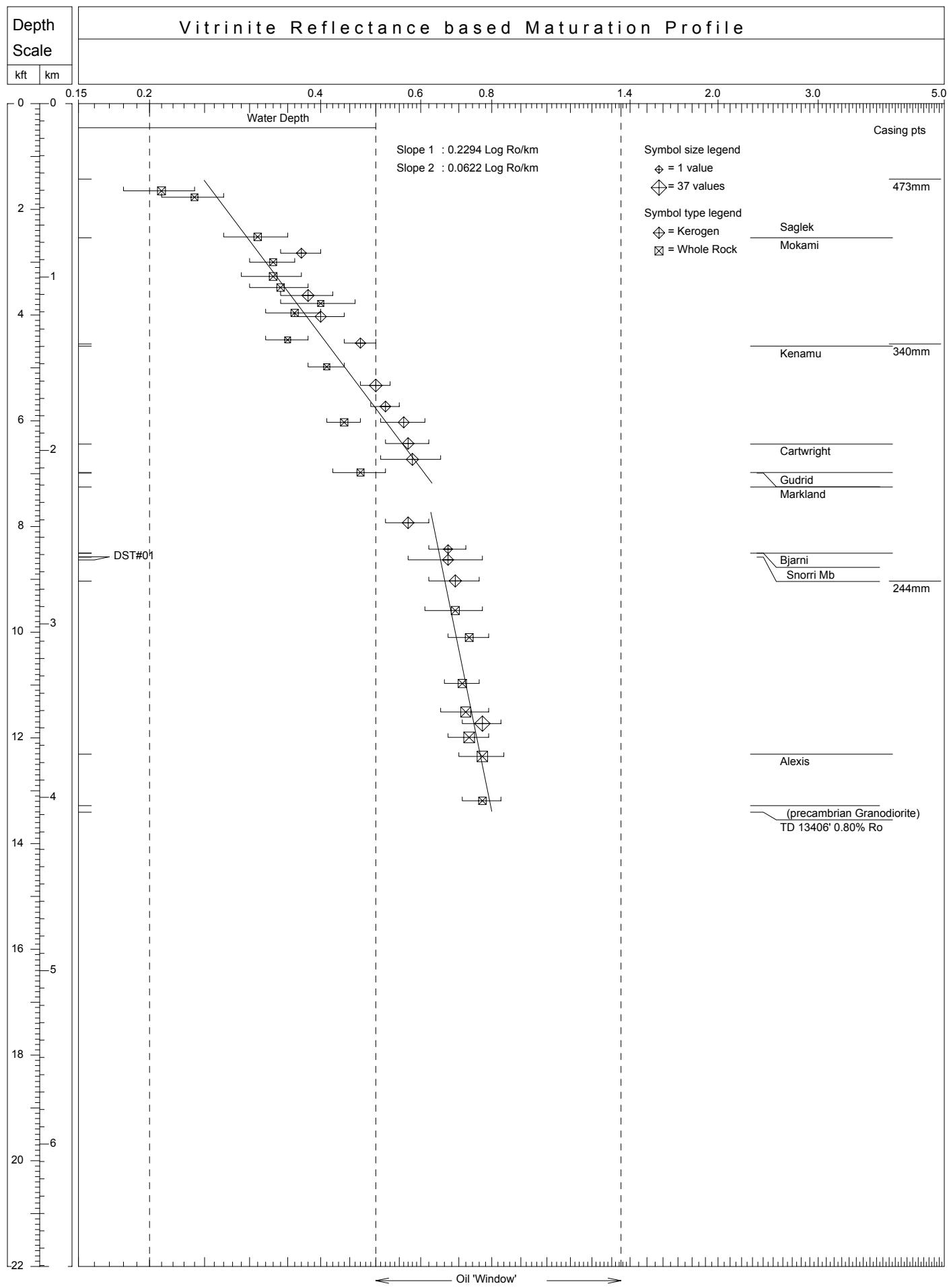


Figure 1. VR/depth plot for Herjolf M-92

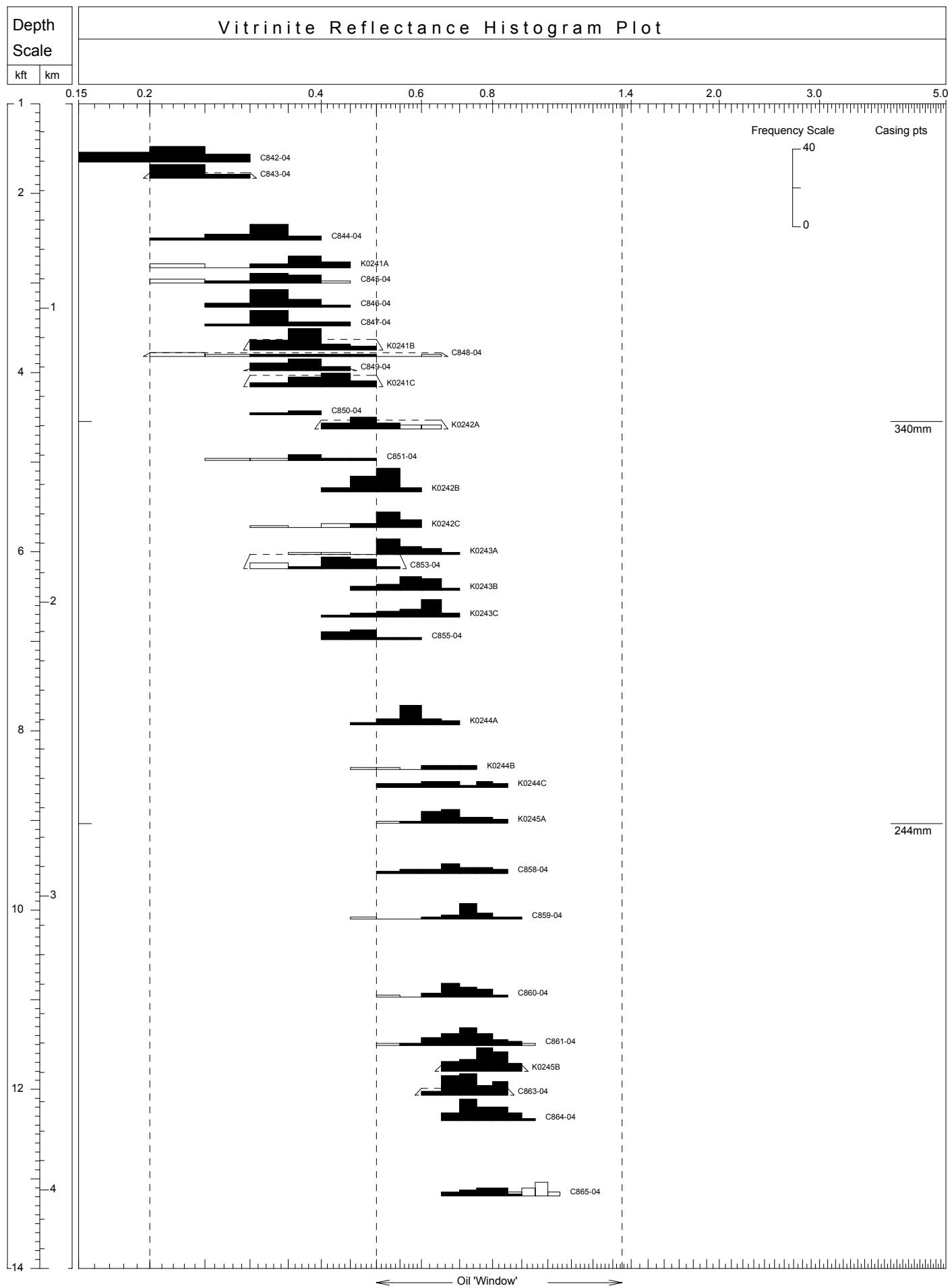


Figure 2. VR Histograms/depth plot for Herjolf M-92

## Appendix I

### Sample Preparation Method

#### **Kerogen concentrate sample preparation**

Preliminary wash (preparation for drill cuttings)

Dry samples in oven (25°C)

#### PALYNOLOGY Lab preparation

Place 20-30 grams in 250 ml plastic beaker.

Add 10% HCl till reaction ceases (removes carbonates).

Rinse 3 times.

Immerse in hot concentrated HF overnight (removes silicates).

Rinse 3 times.

Heat (60-65°C) in concentrated HCl (removes fluorides caused by HF).

Rinse 3 times.

Transfer to 15 ml test tube with 4-5 ml 4% Alconox.

Centrifuge at 1500 rpm for 90 sec.

Decant.

Rinse and centrifuge 3 times.

Float off organic fraction using 2.0 S.G. ZnBr solution.

Centrifuge at 1000 rpm for 8 min.

Float fraction into second test tube.

Wash and centrifuge 3 times.

Make kerogen smear slide.

Remaining kerogen material is made available to Organic Petrology Lab.

#### VITRINITE REFLECTANCE Lab preparation

Pipette off excess water and prepare as 2.5 cm (1") diameter plastic stubs to fit polisher.

Freeze dry and fix material for polishing with epoxy resin.

Polish with diamond-based suspension to obtain low relief, scratch-free surface.

Examine under oil lens, incident light at approximately 1000x magnification.

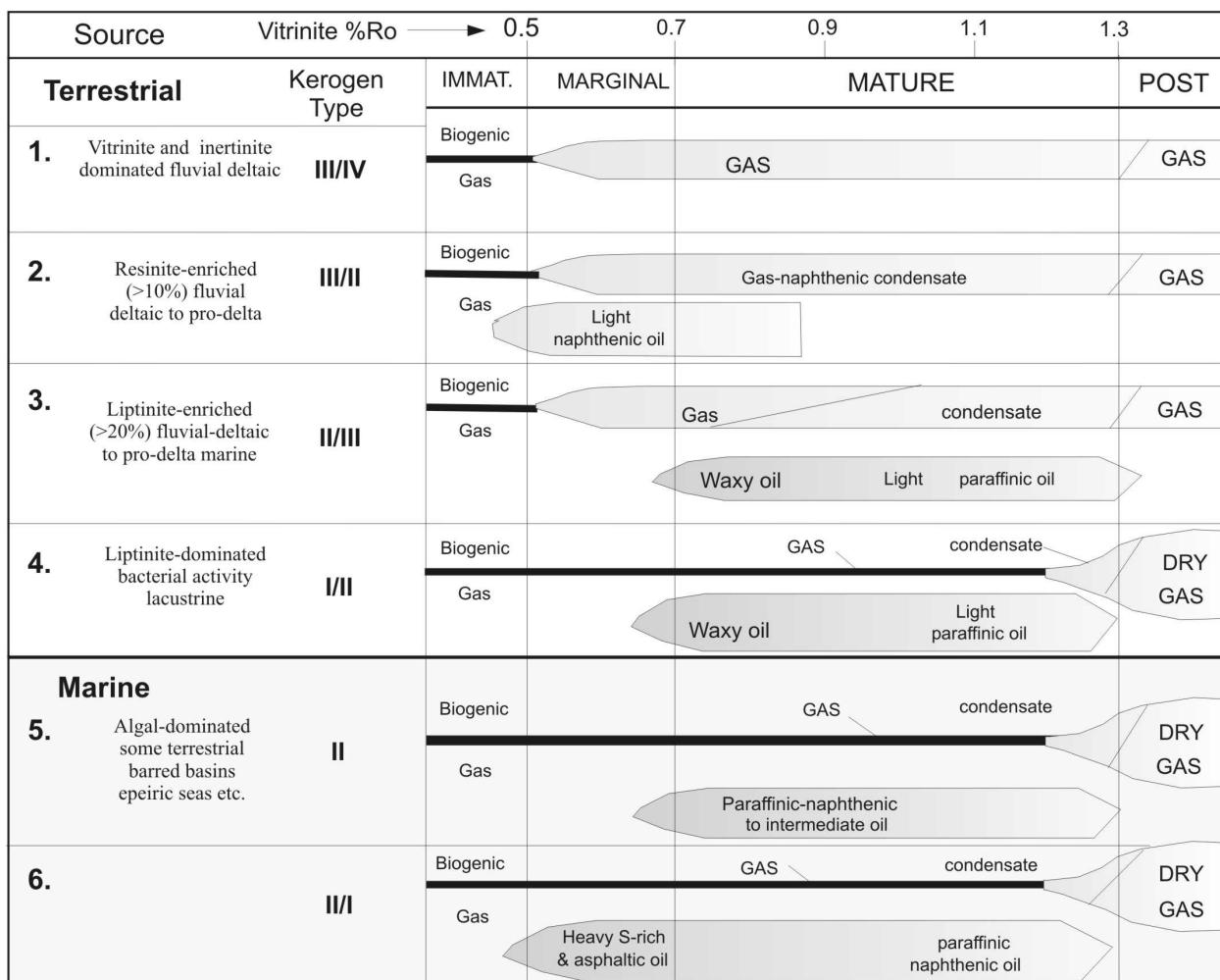
#### **Whole rock sample preparation**

Set washed drill cuttings in epoxy to form 2.5 cm (1") diameter plastic stubs to fit polisher.

Grind and polish to obtain low relief, scratch-free surface.

Examine under oil lens, incident light at approximately 1000x magnification.

Appendix II (Snowdon and Powell 1984)



*Hydrocarbon generation model compiled from Snowdon and Powell (1984) illustrating the different thresholds of hydrocarbon generation and products as related to thermal maturity, kerogen type and paleodepositional environment.*

### **Appendix III**

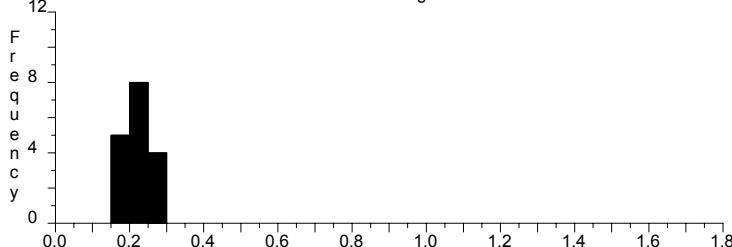
**Data listings and basic statistics**

## Data listings and basic statistics for: Herjolf M-92

C842-04, 1650'

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.15)	(0.18)	(0.17)	(0.21)	(0.17)	(0.18)	(0.20)	(0.20)	(0.25)	(0.21)
	(0.25)	(0.25)	(0.22)	(0.20)	(0.24)	(0.24)	(0.25)	(0.25)	(0.25)	(0.21)
Total	0.21	0.03	17	0.15	0.25	3.57				
(Edit)	0.21	0.03	17	0.15	0.25	3.57				

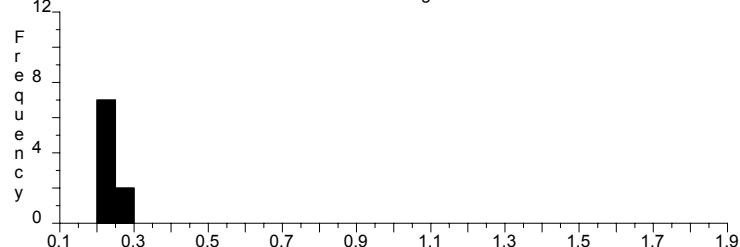
Reflectance Histogram



C843-04, 1770'

Col >	1	2	3	4	5	6	7	8	9
Row	(0.21)	(0.23)	(0.21)	(0.27)	(0.23)	(0.29)	(0.23)	(0.24)	(0.21)
	(0.24)	(0.24)	(0.23)	(0.27)	(0.23)	(0.29)	(0.23)	(0.24)	(0.21)
Total	0.24	0.03	9	0.21	0.29	2.12			
(Edit)	0.24	0.03	9	0.21	0.29	2.12			

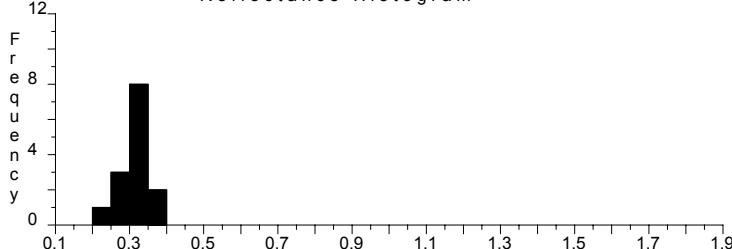
Reflectance Histogram



C844-04, 2520'

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.35)	(0.32)	(0.30)	(0.37)	(0.33)	(0.25)	(0.33)	(0.22)	(0.34)	(0.29)
	(0.31)	(0.28)	(0.31)	(0.34)	(0.33)	(0.25)	(0.33)	(0.22)	(0.34)	(0.29)
Total	0.31	0.04	14	0.22	0.37	4.34				
(Edit)	0.31	0.04	14	0.22	0.37	4.34				

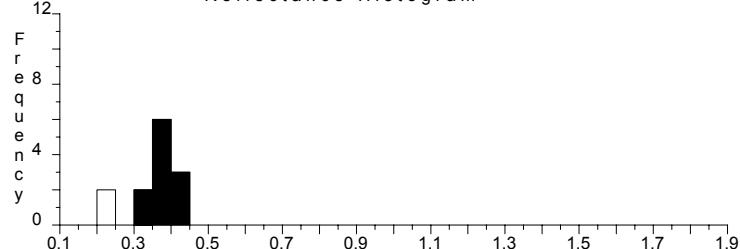
Reflectance Histogram



K0241A, 2830'

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.35)	(0.40)	(0.36)	(0.37)	(0.34)	(0.33)	(0.42)	(0.36)	(0.38)	(0.41)
	(0.35)	(0.37)	(0.20)	(0.37)	(0.34)	(0.33)	(0.42)	(0.36)	(0.38)	(0.41)
Total	0.35	0.06	13	0.20	0.42	4.52				
(Edit)	0.37	0.03	11	0.33	0.42	4.09				

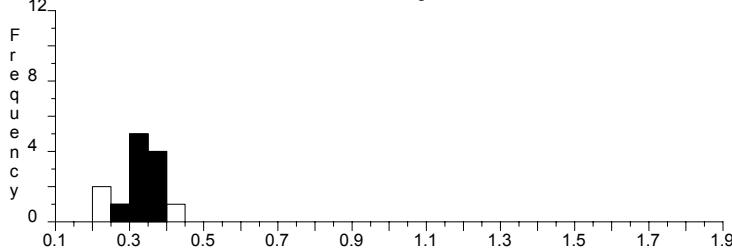
Reflectance Histogram



C845-04, 3000'

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.43)	(0.21)	(0.34)	(0.30)	(0.36)	(0.34)	(0.31)	(0.36)	(0.36)	(0.35)
	(0.33)	(0.29)	(0.23)	(0.34)	(0.36)	(0.34)	(0.31)	(0.36)	(0.36)	(0.35)
Total	0.32	0.06	13	0.21	0.43	4.21				
(Edit)	0.33	0.03	10	0.29	0.36	3.34				

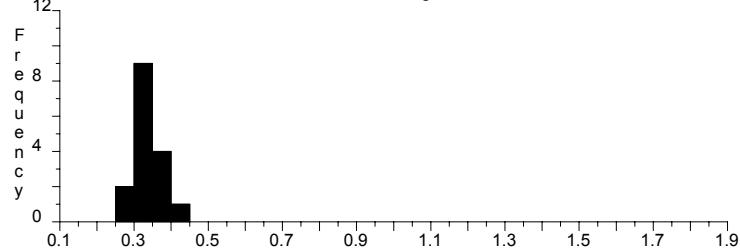
Reflectance Histogram



C846-04, 3270'

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.27)	(0.32)	(0.33)	(0.43)	(0.38)	(0.35)	(0.31)	(0.33)	(0.33)	(0.33)
	(0.30)	(0.35)	(0.33)	(0.37)	(0.32)	(0.28)	(0.31)	(0.33)	(0.33)	(0.33)
Total	0.33	0.04	16	0.27	0.43	5.33				
(Edit)	0.33	0.04	16	0.27	0.43	5.33				

Reflectance Histogram



## Data listings and basic statistics for: Herjolf M-92

C847-04, 3480'

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.31)	(0.37)	(0.32)	(0.41)	(0.42)	(0.33)	(0.33)	(0.32)	(0.34)	(0.27)
1	(0.37)	(0.30)	(0.32)							

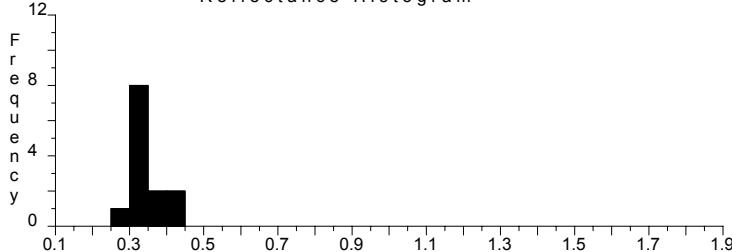
Total	Mean	Stand Dev	Pts	Min	Max	Sum
(Edit)	0.34	0.04	13	0.27	0.42	4.41

K0241B, 3630'

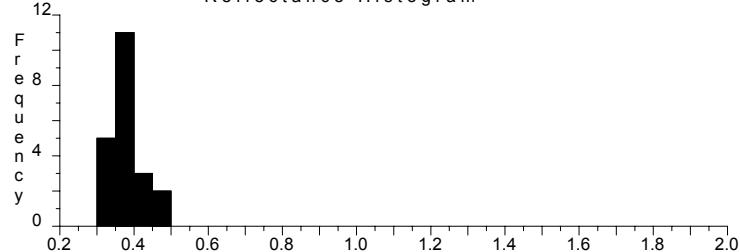
Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.48)	(0.33)	(0.44)	(0.37)	(0.38)	(0.37)	(0.43)	(0.38)	(0.36)	(0.37)
1	(0.38)	(0.40)	(0.33)	(0.46)	(0.35)	(0.34)	(0.37)	(0.38)	(0.36)	(0.33)

Total	Mean	Stand Dev	Pts	Min	Max	Sum
(Edit)	0.38	0.04	21	0.33	0.48	7.94

Reflectance Histogram



Reflectance Histogram

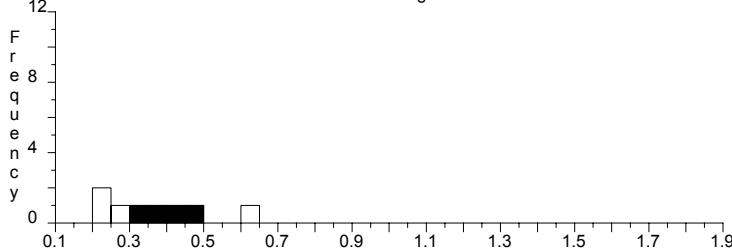


C848-04, 3780'

Col >	1	2	3	4	5	6	7	8
Row	(0.24)	(0.27)	(0.41)	(0.35)	(0.61)	(0.48)	(0.24)	(0.34)
1	(0.24)	(0.27)	(0.41)	(0.35)	(0.61)	(0.48)	(0.24)	(0.34)

Total	Mean	Stand Dev	Pts	Min	Max	Sum
(Edit)	0.40	0.06	8	0.24	0.61	2.94

Reflectance Histogram

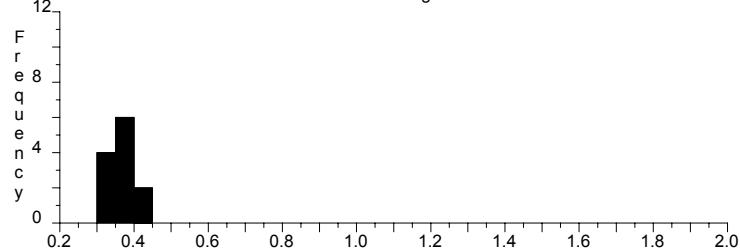


C849-04, 3960'

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.30)	(0.38)	(0.33)	(0.39)	(0.35)	(0.33)	(0.40)	(0.37)	(0.37)	(0.42)
1	(0.30)	(0.38)	(0.33)	(0.39)	(0.35)	(0.33)	(0.40)	(0.37)	(0.37)	(0.42)

Total	Mean	Stand Dev	Pts	Min	Max	Sum
(Edit)	0.36	0.04	12	0.30	0.42	4.31

Reflectance Histogram



K0241C, 4030'

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.33)	(0.40)	(0.47)	(0.40)	(0.41)	(0.40)	(0.47)	(0.37)	(0.38)	
1	(0.33)	(0.41)	(0.47)	(0.40)	(0.41)	(0.40)	(0.47)	(0.37)	(0.38)	

Total	Mean	Stand Dev	Pts	Min	Max	Sum
(Edit)	0.40	0.04	17	0.33	0.49	6.77

Reflectance Histogram

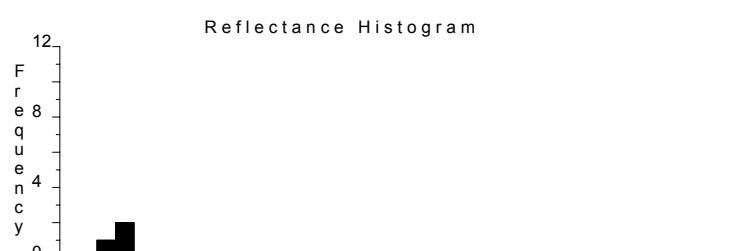


C850-04, 4470'

Col >	1	2	3
Row	(0.38)	(0.35)	(0.32)
1	(0.38)	(0.35)	(0.32)

Total	Mean	Stand Dev	Pts	Min	Max	Sum
(Edit)	0.35	0.03	3	0.32	0.38	1.05

Reflectance Histogram



## Data listings and basic statistics for: Herjolf M-92

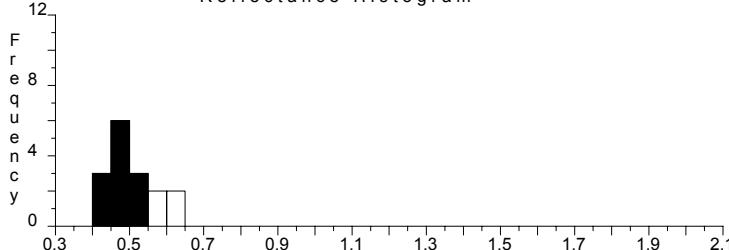
K0242A, 4530'

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.48)	(0.47)	(0.58)	0.61	0.59	(0.46)	(0.44)	(0.48)	(0.51)	(0.48)
1	(0.44)	(0.47)	(0.41)	0.60	0.52	(0.53)				
Total	0.50	0.06	16	0.41	0.61	8.07				
(Edit)	0.47	0.03	12	0.41	0.53	5.69				

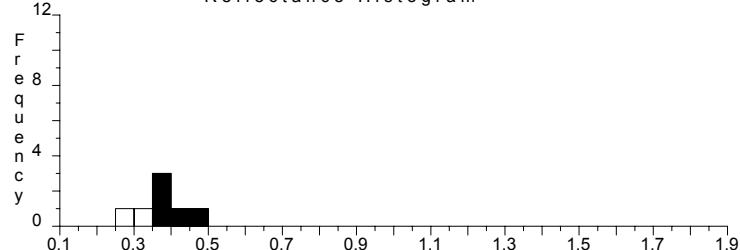
C851-04, 4980'

Col >	1	2	3	4	5	6	7
Row	0.28	0.30	(0.38)	(0.45)	(0.43)	(0.38)	(0.39)
1	0.28	0.30	(0.38)	(0.45)	(0.43)	(0.38)	(0.39)
Total	0.37	0.06	7	0.28	0.45	2.61	
(Edit)	0.41	0.03	5	0.38	0.45	2.03	

Reflectance Histogram



Reflectance Histogram



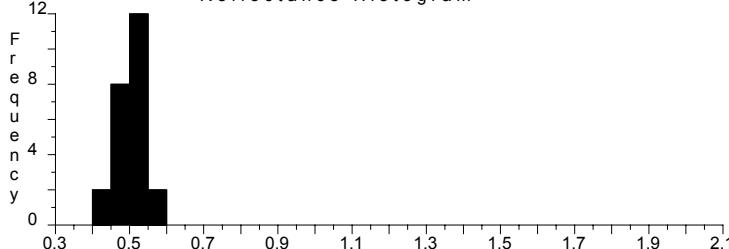
K0242B, 5330'

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.49)	(0.51)	(0.42)	(0.48)	(0.49)	(0.55)	(0.46)	(0.52)	(0.49)	(0.48)
1	(0.52)	(0.50)	(0.56)	(0.54)	(0.50)	(0.53)	(0.43)	(0.48)	(0.49)	(0.50)
Total	0.50	0.03	24	0.42	0.56	11.97				
(Edit)	0.50	0.03	24	0.42	0.56	11.97				

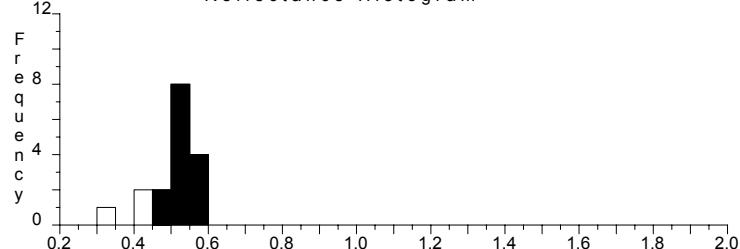
K0242C, 5730'

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.58)	(0.53)	(0.51)	(0.49)	(0.54)	(0.50)	(0.55)	(0.52)	(0.44)	(0.58)
1	(0.48)	(0.51)	(0.49)	(0.49)	(0.44)	(0.50)	(0.55)	(0.52)	(0.44)	(0.58)
Total	0.50	0.06	17	0.33	0.58	8.56				
(Edit)	0.52	0.03	14	0.48	0.58	7.35				

Reflectance Histogram



Reflectance Histogram



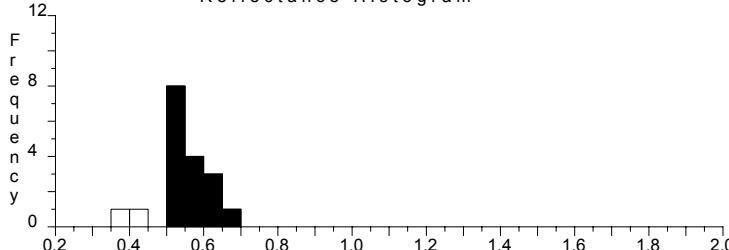
K0243A, 6030'

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.58)	(0.55)	(0.64)	0.38	(0.51)	(0.54)	(0.65)	(0.52)	0.42	(0.52)
1	(0.58)	(0.50)	(0.57)	0.38	(0.51)	(0.54)	(0.64)	(0.54)	0.42	(0.52)
Total	0.55	0.07	18	0.38	0.65	9.84				
(Edit)	0.56	0.05	16	0.50	0.65	9.04				

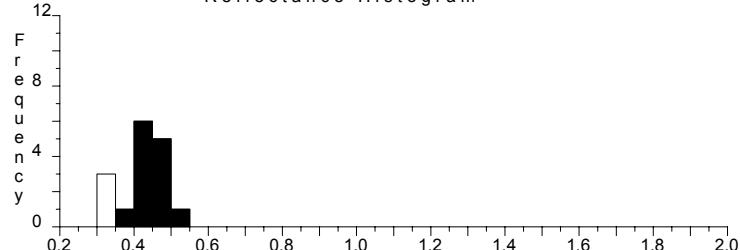
C853-04, 6030'

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.40)	(0.45)	(0.47)	(0.44)	(0.41)	(0.43)	(0.45)	(0.42)	(0.46)	(0.30)
1	(0.34)	(0.44)	(0.36)	(0.50)	(0.43)	(0.45)	(0.45)	(0.42)	(0.46)	(0.30)
Total	0.42	0.06	16	0.30	0.50	6.65				
(Edit)	0.44	0.03	13	0.36	0.50	5.68				

Reflectance Histogram



Reflectance Histogram



## Data listings and basic statistics for: Herjolf M-92

K0243B, 6430'

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.65)	(0.57)	(0.55)	(0.57)	(0.50)	(0.57)	(0.48)	(0.62)	(0.64)	(0.53)
1	(0.63)	(0.57)	(0.62)	(0.54)	(0.57)	(0.48)	(0.64)	(0.60)	(0.57)	

Total	Mean	Stand Dev	Pts	Min	Max	Sum
(Edit)	0.57	0.05	19	0.48	0.65	10.90

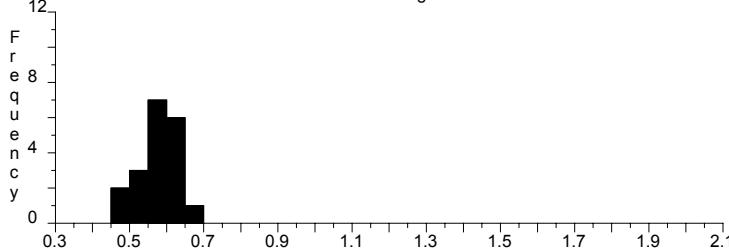
K0243C, 6730'

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.64)	(0.64)	(0.60)	(0.47)	(0.59)	(0.64)	(0.44)	(0.67)	(0.57)	(0.58)
1	(0.61)	(0.66)	(0.50)	(0.62)	(0.56)	(0.54)	(0.64)	(0.64)	(0.49)	(0.51)

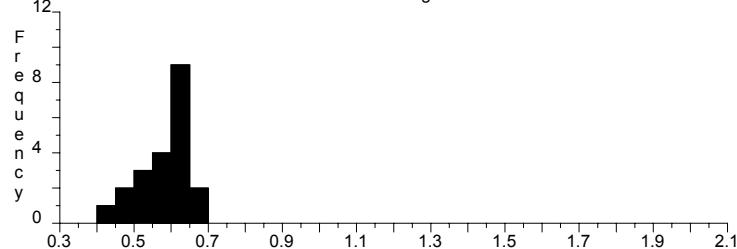
  

Total	Mean	Stand Dev	Pts	Min	Max	Sum
(Edit)	0.58	0.07	21	0.44	0.67	12.21

Reflectance Histogram



Reflectance Histogram



C855-04, 6980'

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.40)	(0.56)	(0.49)	(0.47)	(0.49)	(0.43)	(0.54)	(0.45)	(0.46)	(0.44)
1	(0.42)									

Total	Mean	Stand Dev	Pts	Min	Max	Sum
(Edit)	0.47	0.05	11	0.40	0.56	5.15

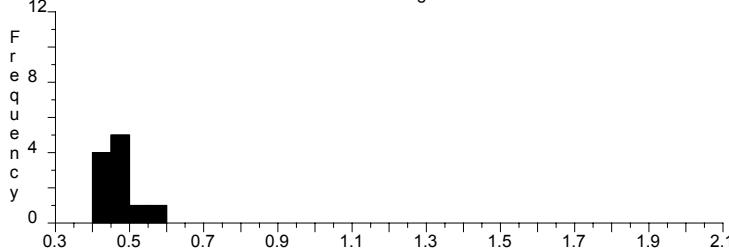
K0244A, 7930'

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.64)	(0.45)	(0.58)	(0.62)	(0.64)	(0.55)	(0.59)	(0.56)	(0.50)	(0.57)
1	(0.53)	(0.66)	(0.56)	(0.54)	(0.57)	(0.58)	(0.57)	(0.56)	(0.65)	

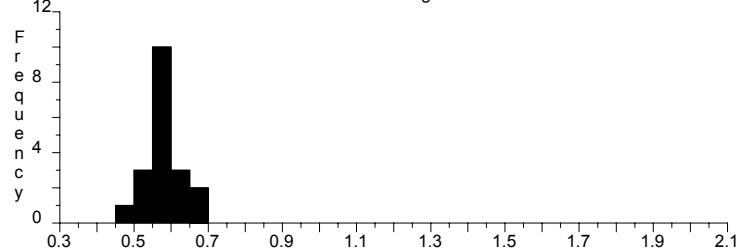
  

Total	Mean	Stand Dev	Pts	Min	Max	Sum
(Edit)	0.57	0.05	19	0.45	0.66	10.92

Reflectance Histogram



Reflectance Histogram



K0244B, 8430'

Col >	1	2	3	4	5	6	7	8
Row	(0.74)	(0.70)	(0.65)	(0.45)	(0.63)	(0.50)	(0.62)	(0.69)
1	(0.74)							

Total	Mean	Stand Dev	Pts	Min	Max	Sum
(Edit)	0.62	0.10	8	0.45	0.74	4.98

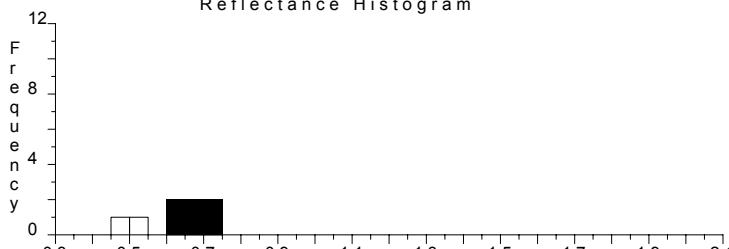
K0244C, 8630'

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.76)	(0.75)	(0.58)	(0.69)	(0.54)	(0.83)	(0.51)	(0.77)	(0.61)	(0.62)
1	(0.70)	(0.67)	(0.56)	(0.66)	(0.61)	(0.81)				

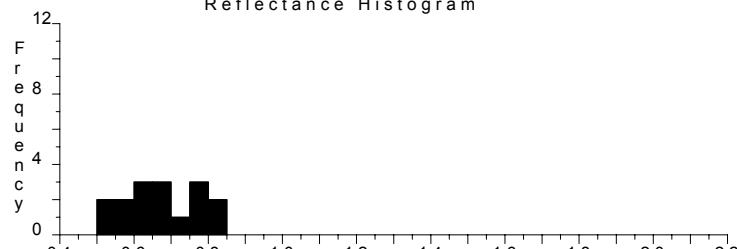
  

Total	Mean	Stand Dev	Pts	Min	Max	Sum
(Edit)	0.67	0.10	16	0.51	0.83	10.67

Reflectance Histogram



Reflectance Histogram



## Data listings and basic statistics for: Herjolf M-92

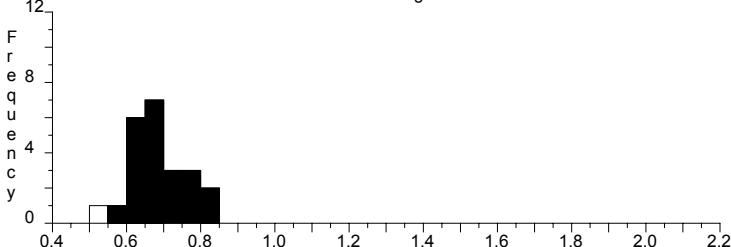
K0245A, 9030'

Col >	1	2	3	4	5	6	7	8	9	0
Row 1	(0.80)	(0.66)	(0.50)	(0.84)	(0.67)	(0.65)	(0.59)	(0.78)	(0.78)	(0.77)
Row 2	(0.70)	(0.61)	(0.61)	(0.61)	(0.62)	(0.67)	(0.60)	(0.67)	(0.73)	(0.68)
Total	0.68	0.08	23	0.50	0.84	15.58				
(Edit)	0.69	0.07	22	0.59	0.84	15.08				

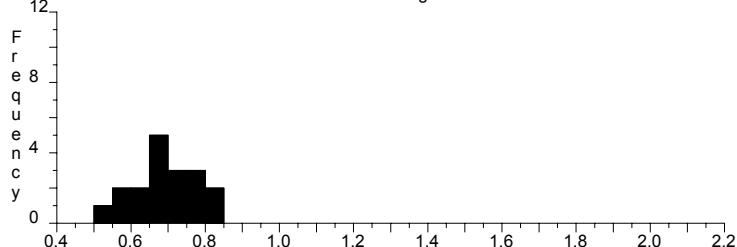
C858-04, 9590'

Col >	1	2	3	4	5	6	7	8	9	0
Row 1	(0.56)	(0.67)	(0.76)	(0.64)	(0.76)	(0.65)	(0.76)	(0.68)	(0.63)	(0.66)
Row 2	(0.56)	(0.83)	(0.67)	(0.82)	(0.74)	(0.74)	(0.54)	(0.76)	(0.70)	(0.66)
Total	0.69	0.08	18	0.54	0.83	12.37				
(Edit)	0.69	0.08	18	0.54	0.83	12.37				

Reflectance Histogram



Reflectance Histogram



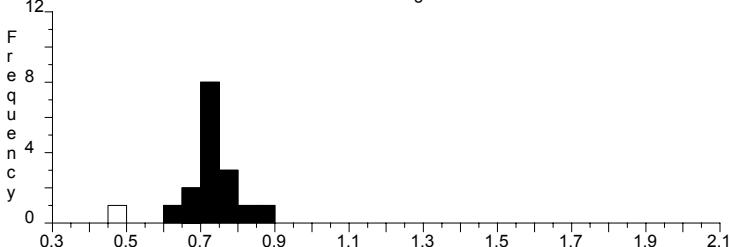
C859-04, 10100'

Col >	1	2	3	4	5	6	7	8	9	0
Row 1	(0.74)	(0.79)	(0.72)	(0.62)	(0.66)	(0.73)	(0.65)	(0.75)	0.46	(0.72)
Row 2	(0.71)	(0.71)	(0.71)	(0.87)	(0.72)	(0.75)	(0.82)			
Total	0.71	0.09	17	0.46	0.87	12.13				
(Edit)	0.73	0.06	16	0.62	0.87	11.67				

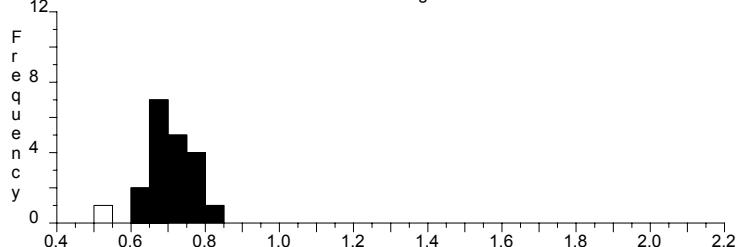
C860-04, 10970'

Col >	1	2	3	4	5	6	7	8	9	0
Row 1	(0.53)	(0.60)	(0.78)	(0.67)	(0.76)	(0.69)	(0.64)	(0.71)	(0.69)	(0.70)
Row 2	(0.72)	(0.78)	(0.67)	(0.69)	(0.64)	(0.71)	(0.69)	(0.76)	(0.76)	(0.70)
Total	0.70	0.06	20	0.53	0.81	14.04				
(Edit)	0.71	0.05	19	0.60	0.81	13.51				

Reflectance Histogram



Reflectance Histogram



C861-04, 11510'

Col >	1	2	3	4	5	6	7	8	9	0
Row 1	(0.74)	(0.50)	(0.77)	(0.82)	(0.80)	(0.71)	(0.64)	(0.71)	(0.73)	(0.62)
Row 2	(0.86)	(0.67)	(0.73)	(0.72)	(0.75)	(0.63)	(0.79)	(0.69)	(0.58)	(0.69)
Row 3	(0.83)	(0.70)	(0.64)	0.93	(0.77)	(0.75)	(0.76)	(0.68)	(0.73)	(0.67)

Total	Mean	Stand Dev	Pts	Min	Max	Sum				
(Edit)	0.72	0.09	33	0.50	0.93	23.90				
Total	0.72	0.07	31	0.58	0.87	22.47				

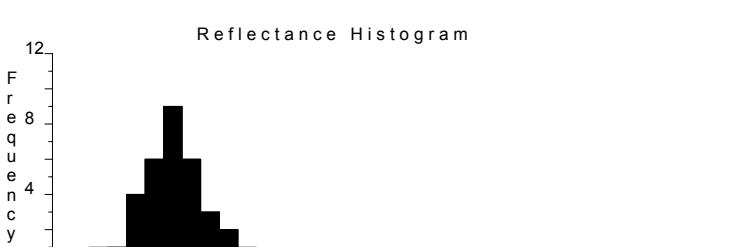
K0245B, 11730'

Col >	1	2	3	4	5	6	7	8	9	0
Row 1	(0.89)	(0.77)	(0.69)	(0.69)	(0.80)	(0.81)	(0.79)	(0.89)	(0.82)	(0.80)
Row 2	(0.79)	(0.74)	(0.86)	(0.81)	(0.75)	(0.71)	(0.70)	(0.72)	(0.82)	(0.77)
Row 3	(0.77)	(0.75)	(0.81)	(0.77)	(0.75)	(0.71)	(0.75)	(0.71)	(0.81)	(0.68)

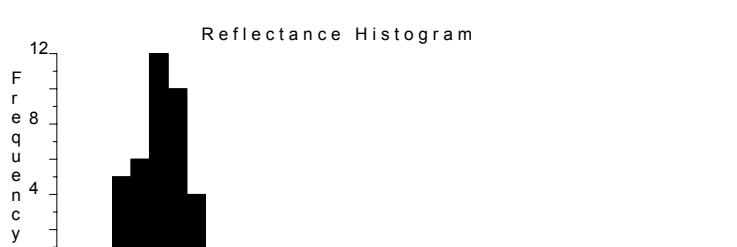
  

Total	Mean	Stand Dev	Pts	Min	Max	Sum				
(Edit)	0.77	0.06	37	0.68	0.89	28.53				
Total	0.77	0.06	37	0.68	0.89	28.53				

Reflectance Histogram



Reflectance Histogram



## Data listings and basic statistics for: Herjolf M-92

C863-04, 11990'

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.69)	(0.83)	(0.80)	(0.79)	(0.71)	(0.75)	(0.60)	(0.73)	(0.74)	(0.72)
1	(0.65)	(0.71)	(0.82)	(0.71)	(0.70)	(0.68)	(0.69)	(0.79)	(0.84)	(0.81)
2	(0.65)	(0.74)	(0.71)	(0.74)	(0.64)	(0.82)	(0.79)	(0.81)	(0.69)	(0.67)
3	(0.77)	(0.67)	(0.66)	(0.67)	(0.74)					

Total	Mean	Stand Dev	Pts	Min	Max	Sum	Total	Mean	Stand Dev	Pts	Min	Max	Sum
(Edit)	0.73	0.06	35	0.60	0.84	25.53	(Edit)	0.77	0.07	34	0.65	0.90	26.13

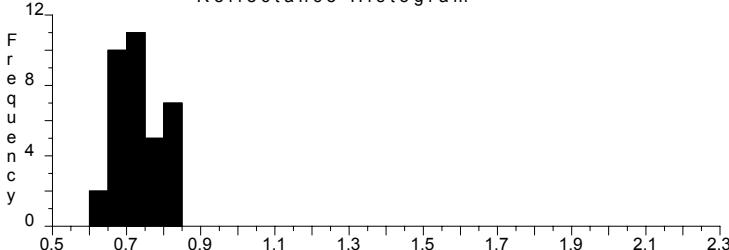
C864-04, 12350'

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.69)	(0.71)	(0.74)	(0.82)	(0.68)	(0.78)	(0.70)	(0.73)	(0.89)	(0.90)
1	(0.83)	(0.86)	(0.75)	(0.75)	(0.70)	(0.79)	(0.73)	(0.85)	(0.83)	(0.72)
2		(0.71)	(0.74)	(0.82)	(0.65)	(0.73)				
3		(0.78)	(0.85)	(0.83)	(0.76)					

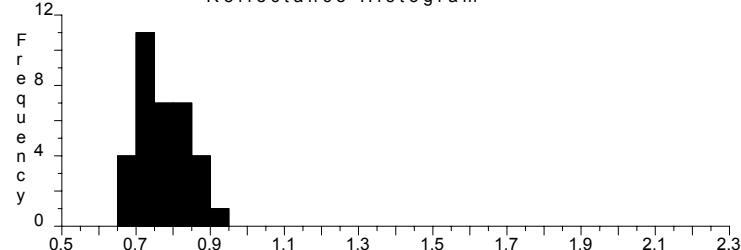
  

Total	Mean	Stand Dev	Pts	Min	Max	Sum	Total	Mean	Stand Dev	Pts	Min	Max	Sum
(Edit)	0.77	0.07	34	0.65	0.90	26.13	(Edit)	0.77	0.07	34	0.65	0.90	26.13

Reflectance Histogram



Reflectance Histogram



C865-04, 13190'

Col >	1	2	3	4	5	6	7	8	9	0
Row	0.86	(0.96)	(0.89)	(0.98)	(1.04)	0.79	0.81	0.78	(0.98)	0.67
1	(0.93)	(0.97)	0.68	0.78	0.84	0.74	(0.95)	0.74	(0.90)	0.72
2	0.75	(0.92)	(0.93)	(0.98)	(0.99)	0.80	0.83	(1.01)		

Total	Mean	Stand Dev	Pts	Min	Max	Sum	Total	Mean	Stand Dev	Pts	Min	Max	Sum
(Edit)	0.86	0.11	28	0.67	1.04	24.22	(Edit)	0.96	0.04	14	0.89	1.04	13.43

Reflectance Histogram

