Phytoplankton Producitivity Experiments in British Columbia Coastal Waters, 1982 and 1983

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Les rapports statistiques servent de véhicule pour la compilation et la diffusion des données sous une forme directement utilisable par les scientifiques et les techniciens. En général, les rapports contiennent des données brutes ou analysées, mais ne fournissent pas d'interprétation des données. Ces compilations sont préparées le plus souvent à l'appui de travaux liés aux programmes et intérêts du service des Sciences et levés océaniques (SLO) du ministère des Pêches et des Océans.

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Les rapports statistiques sont produits à l'échelon régional, mais numérotés à l'échelon national. Les demandes de rapports seront satisfaites par l'établissement auteur dont le nom figure sur la couverture et la page du titre. Les rapports épuisés sont fournis contre rétribution par des agents commerciaux.

Les établissements des Sciences et levés océaniques dans les régions et à l'administration centrale ont cessé de publier leurs diverses séries de rapports en décembre 1981. Une liste complète de ces publications figure dans le volume 39, Index des publications 1982, du *Journal canadien des sciences halieutiques et aquatiques*. La série actuelle a commencé avec la publication du rapport numéro 1 en janvier 1982.

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PHYTOPLANKTON PRODUCTIVITY EXPERIMENTS IN BRITISH COLUMBIA COASTAL WATERS, 1982 AND 1983

by

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RÉSUMÉ

Forbes, J.R., H.A. Sefton and K. de Macedo. 1983. Phytoplankton productivity experiments in British Columbia coastal waters, 1982 and 1983. Can. Data Rep. Hydrogr. Ocean Sci. 14: 193 p.

On donne les résultats d'expériences sur la productivité par rapport à l'intensité de lumière (P(I)) réalisées lors de quatre expéditions effectuées dans les eaux côtières de la Columbie-Britannique.

Les données ont été ajustées au modèle de Platt et al. (1980), lequel utilise une équation empirique qui décrit la photosynthèse comme une fonction continue de la lumière à travers toutes les intensités que le phytoplancton est susceptible de rencontrer.

Les mesures individuelles de productivité et d'intensité de lumière, les paramètres ajustés et dérivés, de même que les diagrammes des données simples et de courbes ajustées sont présentés pour chaque expérience.

Les résultats de deux expériences de production in situ réalisées de concert avec les expériences de P(I) dans le détroit d'Hécate sont également indiqués.

Mots-clés: données, productivité, lumière, phytoplancton

ABSTRACT

Forbes, J.R., H.A. Sefton and K. de Macedo. 1983. Phytoplankton productivity experiments in British Columbia coastal waters, 1982 and 1983. Can. Data Rep. Hydrogr. Ocean Sci. 14: 193 p.

The results of productivity versus light intensity (P(I)) experiments performed on four cruises in British Columbia coastal waters are reported.

Data were fitted to the model of Platt et al. (1980). This uses an empirical equation that describes photosynthesis as a continuous function of light through all intensities liable to be encountered by phytoplankton.

Individual measurements of productivity and light intensity, fitted and derived parameters, and plots of data points and fitted curves are presented for each experiment.

Results from two in situ production experiments carried out in conjunction with P(I) experiments in Hecate Strait are also reported.

KEYWORDS: data, productivity, light, phytoplankton

ACKNOWLEDGEMENTS

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INTRODUCTION

This work forms a part of the results of four cruises. These cruises were directed towards investigation of the interaction of physical oceanographic features and plankton productivity. A series of productivity versus light intensity (P(I)) experiments were performed to examine more closely the response of phytoplankton populations to light. Additional data from these cruises will be issued in the Canadian Data Reports of Hydrography and Ocean Sciences series.

During two cruises in 1983 a number of 24-hour stations were occupied. Results from a series of P(I) experiments at these stations will provide data on diel changes in photosynthetic parameters for populations in this region. They will permit a reassessment of productivity data collected at various times of day during regional surveys. Results from the 24-hour stations will also provide data for models of P(I) response to prior light history.

In situ productivity experiments were carried out at two stations in Hecate Strait, in conjunction with 24-hour P(I) experimental series.

METHODS

1. Sampling Methods

Surface samples were taken by bucket. Temperature was recorded and subsamples were taken for analysis of productivity, chlorophyll *a*, pH, and salinity.

Subsurface samples were collected using an integrated oceanographic vertical profiler, including data acquisition system, and a remotely triggerable array of Niskin bottles (rosette sampler) (Hill et al., 1983). The vertical profiler included sensors to measure conductivity, temperature and depth (Guildline model 8701 digital CTD); chlorophyll fluorescence (Variosens III in situ fluorometer); beam attenuance (Martek 1m path length or Sea-Tech 0.25m path length transmissometer); and photosynthetically active quantum scalar irradiance (PAR) (Licor 193SB spherical quantum irradiance sensor). Estimated precision and accuracy of these sensors are described in Hill et al. (1983).

Water for productivity experiments was drawn off directly into large, dark bottles for subsampling in the ship's laboratory. This avoided excessive exposure to surface illumination.

2. P(I) Experimental Method

Between 17 and 21 productivity subsamples were placed in a linear incubator for each experiment. In addition 2 dark subsamples were included. Illumination was provided by a 1000 W tungsten-halogen lamp. Spectral quality was modified by passage through a sheet of blue plexiglass (Rohm and Haas 2069), to approximate more closely the <u>in situ</u> spectral distribution.

The temperature of the incubator during cruises 82-01 and 82-02 was controlled by circulation of water from 3m depth obtained through the ship's fire system. For cruises 83-02 and 83-04 a closed system with a self-contained refrigeration unit was used. With this the temperature could be precisely controlled

Photosynthetically active radiation was measured at the location of each light bottle in the incubator using a Biospherical Instruments QSL100 quantum sensor. Light intensity was converted to uEin.s-1.m-2 (1 uEin.s-1.m-2 = 6.023 x 10^{13} quanta.s-1.cm-2). (1)

(1) Throughout this report the prefix 'u' will be used to represent $*10^{-6}$ (equivalent to S.I. prefix μ)

3. *In Situ* Production Experimental Method

Samples were taken from five depths at stations where *in situ* production experiments were performed. Each sample was subsampled into two light bottles and one dark bottle. The subsamples were incubated at the depth from which they had been collected by suspension from the mid-point of a horizontal, dumb-bell type of float, which reduced shading of near-surface samples. A second float, equipped with a radar reflector and VHF transmitter to assist in tracking and recovery, was attached to the first by line.

4. Productivity

a. Productivity measurements in 1982

Uptake of ^{14}C was determined by a modified version of the method of Strickland and Parsons (1972). Subsamples of 125ml were incubated for 2 hours. 1000ul of 0.185 $MBq.ml^{-1}$ $NaH^{14}CO_3$ was added to each subsample. Following incubation subsamples were filtered onto 47mm diameter, 0.45u pore size membrane filters (Millipore HA). These were fumed for approximately 1 minute over concentrated HCl and placed in scintillation vials with 15ml Aquasol LSC cocktail. Activity was measured using a Beckman LS-3133T liquid scintillation counter, with counting efficiency determined by the external standard channels ratio method.

Dissolved inorganic carbon was determined by the method of Strickland and Parsons (1972), assuming a specific alkalinity of 0.123 and seawater density of 1.025. *In situ* temperature and salinity were derived from CTD profiles. pH was measured with an analog pH meter having a nominal relative accuracy of +/- 0.01 pH.

b. Productivity measurements in 1983

The technique for uptake determinations was modified in 1983. Subsample size was reduced to 60 ml and incubation time to 1 hour. In situ production samples were incubated for approximately 4 hours. Activity was measured using an LKB 1217 liquid scintillation counter, with counting efficiency determined by the sample channels ratio method.

On cruise 83-02, where brackish water was encountered at many stations, total alkalinity was determined by the pH method (Grasshoff, 1976). The reference electrode was calibrated to obtain a set of f'_{H^+} values (empirical activity coefficient of H+) in an appropriate range of salinities. pH was measured with a digital pH meter having a nominal relative accuracy of +/-0.003 pH.

c. Precision of Productivity measurements

The coefficient of variation was determined for 23 sets of replicate light bottles on cruise 82-02. These were incubated under identical light intensities. The mean coefficient of variation was 4.13%, with a range from 0.02% to 26.0%.

5. Chlorophyll a

Extracted chlorophyll a was detemined by fluorometry (Holm-Hansen et al., 1965). Two replicate samples for each experiment were filtered onto 25cm glass fiber filters (Whatman 934AH). Approximately 0.5ml 1% $NaCO_3$ suspension was added to the sample just prior to completion of filtration to prevent degradation of the chlorophyll extract. A tissue grinder was used to extract the chlorophyll in 90% aqueous acetone. The extract was clarified by refiltration through a glass fiber filter and the fluorescence of the filtrate measured with a Turner Designs 10 fluorometer. The sample was acidified with 2 drops 1.5N HCl and the fluorescence was redetermined after the reading had stabilized.

Chlororophyll a content was determined by the following equation:

$$\text{Chl } a \text{ (mg.m-3)} = F_D * (R_b - R_a) * (D/V)$$

where: F_D = sensitivity factor for sensitivity setting as determined by calibration

R_b = sample fluorescence before acidification

R_a = sample fluorescence after acidification

D = volume of extract (ml)

V = volume filtered (l)

The fluorometer was calibrated against a Perkin Elmer Hitachi 200 spectrophotometer using extracts from mixed species cultures in active growth phase. Chlorophyll a concentrations in the calibration extracts were calculated using the SCOR-UNESCO equations (Strickland and Parsons, 1972):

$$\text{Chl } a \text{ (mg.m-3)} = (11.64E_{663} - 2.16E_{645} + 0.10E_{630}) / V$$

where: E_{663} = optical density (O.D) at 663nm

E_{645} = O.D. at 645nm

E_{630} = O.D. at 630nm

V = volume filtered (l)

All optical densities were corrected to the equivalent of extract volumes of 10ml measured in 10cm path length cells. They were also corrected for turbidity by subtracting the O.D. at 750nm from each reading.

F_D values for each sensitivity setting were determined by regressing a series of dilutions with known chlorophyll a concentrations against fluorescence output.

An estimate of the precision of the method was made during cruise 82-02. Five rosette bottles were tripped at a single depth and three replicate samples were drawn from each. The mean value was 3.01 mg Chl a.m^{-3}, with a standard deviation of 0.148. The coefficient of variation was 4.9%. Two way analysis of variance indicated no significant difference between samples drawn from one or more bottles tripped at the same depth ($F_{treatments}$ = 0.307; $F_{replicates}$ = 0.712). Samples for this test were taken in calm conditions. Samples taken in heavy weather from a zone with a sharp chlorophyll gradient would exhibit a greater variance between bottles.

6. Calculation of Local Apparent Time

Interest in the diel variation of P(I) parameters required that the time of sampling be known in terms of actual solar time. This is termed Local Apparent Time (LAT) (Bowditch, 1975).

Sampling times were recorded in zone time (Pacific Daylight Time). LAT is calculated by conversion to Pacific Standard Time (- 1h); correction for the difference in longitude from the zone meridian (- 4m) for each degree west of 120°W); and application of the Equation of Time, which corrects for the offset of the sun's path from the celestial equator and other irregularities in the orbit of the earth. Values of the Equation of Time for the specific sampling times were obtained from the Nautical Almanac (H.M. Nautical Almanac Office; 1981, 1982).

7. Calculation of P(I) Parameters

P(I) data were fitted to the model of Platt et al. (1980) using the routine 'Curfit' (Bevington, 1969), which performs a non-linear least squares fit using the Marquardt algorithm. The model is of the form:

$$PB = P_s * (1-e^{-\alpha * I/P_s}) * e^{-\beta * I/P_s}$$

where: PB = normalized productivity (mg C.(mg Chl a)-1.h-1)

P_s = maximum potential light saturated photosynthetic rate of the population (mg C.(mg Chl a)-1.h-1)

α = initial slope (mg C.(mg Chl a)-1.h-1.(uEin.s-1.m-2)-1)

β = parameter characterizing photoinhibition (mg C.(mg Chl a)-1.h-1.(uEin.s-1.m-2)-1)

Four derived parameters were calculated for each experiment (Platt et al., 1980). P_m is the maximum potential productivity of the population in its present physiological state. I_m is the light intensity at which $PB = P_m$. I_s is an index of light adaptation, specifically the light intensity at which a projected line of the slope α reaches P_s. I_b is an index of photoinhibition, representing the light intensity at which $PB = 0.37 * P_s$ in the photoinhibitory portion of the curve, where $I > I_m$.

These parameters are calculated by the following equations:

$$P_m = P_s * (\alpha / (\alpha+\beta)) * (\beta / (\alpha+\beta))^{(\beta / \alpha)}$$

$$I_m = P_s / \alpha \log_e ((\alpha + \beta)/(\beta))$$

$$I_s = P_s / \alpha$$

$$I_b = P_s / \beta$$

The units of P_m are mg C.(mg Chl a)$^{-1}$.h^{-1}. The units of I_m, I_s and I_b are uEin.s^{-1}.m^{-2}.

The adequacy of the fit of the data was tested for each experiment by determing the variance of the data about the fitted curve:

$$r^2 = (A - B) / A$$

where : $A = \Sigma(y - \bar{y})^2 / (n-1)$

$B = \Sigma(y - \hat{y})^2 / (n-3)$

Where the correlation coefficient (r) was not significant at $p < 0.01$ the data were assumed to be inadequate to describe the curve fully and the experiment was not considered further.

90% confidence limits for the individual fitted parameters were calculated using the equation of Irwin et al. (1980).

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ORGANIZATION OF DATA SECTION

Data are organized in two sections for each cruise. First productivity and light intensity data are listed in tabular form by consecutive station number. This is followed by a section providing detailed station information, fitted and derived parameters and plots of data and fitted curves, again arranged by consecutive station number.

Production and associated data for the *in situ* production stations on cruise 83-04 are listed at the end of the report, together with plots of production by depth.

At some stations on cruise 83-04 smaller numbers of subsamples were taken than the number required for fitting the P(I) model. Productivity and light intensity data for these stations are inserted at the appropriate points in the data listings. Plots of the data are also included, but no fitting was attempted.

PARAMETERS: UNITS AND FORMS USED IN TABLES AND PLOTS

Parameter	Form in tables and plots	Units
PB		mg C.(mg Chl a)-1.h-1
P_s	Ps	mg C.(mg Chl a)-1.h^{-1}
α	Alpha	mg C.(mg Chl a)-1.h-1 .(uEin.s-1.m-2)-1
β	Beta	mg C.(mg Chl a)-1.h^{-1} .(uEin.s-1.m-2)-1
P_m	Pm	mg C.(mg Chl a)-1.h^{-1}
I		uEin.s-1.m-2
I_s	Is	uEin.s-1.m^{-2}
I_m	Im	uEin.s^{-1}.m^{-2}
I_b	Ib	uEin.s-1.m^{-2}

STATION POSITIONS

Cruise 82-01

Station	Latitude	Longitude	Region
1	49o 16.0' N	123o 45.7' W	Strait of Georgia
3	49o 16.0' N	123o 45.7' W	" " "
4	49o 16.2' N	123o 22.0' W	" " "
9	49o 14.2' N	123o 36.6' W	" " "
13	49o 13.0' N	123o 45.4' W	" " "
20	49o 15.8' N	123o 24.9' W	" " "
23	49o 19.0' N	123o 53.0' W	" " "

Cruise 82-02

Station	Latitude	Longitude	Region
3	49o 16.5' N	123o 48.2' W	Strait of Georgia
12	49o 24.9' N	124o 03.0' W	" " "
19	49o 19.6' N	123o 40.5' W	" " "

Cruise 83-02

Station	Latitude	Longitude	Region	
2	49o 13.4' N	123o 45.4' W	Strait of Georgia	
P01	49o 03.3' N	123o 26.5' W	" " "	**
P02	49o 00.3' N	123o 25.9' W	" " "	
P03	48o 57.4' N	123o 25.9' W	" " "	
P04	48o 57.7' N	123o 27.9' W	" " "	
P05	48o 58.9' N	123o 28.3' W	" " "	
P06	49o 00.5' N	123o 27.0' W	" " "	
P07	49o 00.1' N	123o 23.3' W	" " "	
P08	48o 58.3' N	123o 21.6' W	" " "	
P09	48o 57.4' N	123o 22.4' W	" " "	
P10	48o 57.6' N	123o 21.7' W	" " "	
P11	49o 16.8' N	123o 33.7' W	" " "	
P12	49o 12.0' N	123o 32.4' W	" " "	
P15 - P17	48o 37.0' N	123o 30.0' W	Saanich Inlet	*
P18 - P20	48o 38.5' N	123o 30.0' W	" "	*
P22 - P29	48o 37.0' N	123o 30.0' W	" "	*
P30 - P33	48o 35.6' N	123o 30.0' W	" "	*

* 24-hour station series.
** Stations P01 - P10 were sampled during a drogue-tracking experiment.

Cruise 83-04

Station	Latitude	Longitude	Region	
P08	48o 49.0' N	128o 39.4' W	West coast of Vancouver Island	
20	49o 24.0' N	126o 40.0' W	" "	
22	50o 04.8' N	128o 36.6' W	" "	
25	50o 16.0' N	128o 16.4' W	" "	
34	50o 59.5' N	128o 47.6' W	Queen Charlotte Sd.	
40	51o 15.6' N	129o 22.3' W	" " "	
43	51o 27.4' N	129o 04.4' W	" " "	
50	51o 09.9' N	128o 24.9' W	" " "	
55	51o 01.6' N	128o 26.0' W	" " "	
62	50o 49.5' N	127o 27.0' W	Queen Charlotte St.	
73	52o 03.4' N	129o 42.8' W	Queen Charlotte Sd.	
79	53o 19.2' N	130o 13.1' W	Hecate Strait	
92	53o 19.2' N	131o 02.8' W	" "	
94	53o 11.6' N	131o 00.3' W	" "	
96A - 96Y	53o 13.2' N	131o 02.8' W	" "	*
101 - 131	53o 11.5' N	131o 13.6' W	" "	*
07.11/1452 (U1)	54o 24.0' N	133o 47.0' W	Dixon Entrance	**
07.11/1958 (U2)	53o 59.2' N	133o 23.0' W	West coast of Queen Charlotte Islands	
07.12/1059 (U3)	53o 30.7' N	133o 41.0' W	" "	
07.13/1032 (U4)	52o 34.4' N	132o 54.6' W	" "	
07.13/1535 (U5)	52o 52.0' N	132o 20.8' W	" "	
07.14/1250 (U6)	51o 47.6' N	131o 40.6' W	" "	
07.15/1145 (U7)	49o 40.5' N	127o 29.0' W	West coast of Vancouver Island	

* 24-hour station series.

** Stations 07.11/1452 to 07.15/1145 are shown as U1 to U7 respectively on the map of station positions (p. 17).

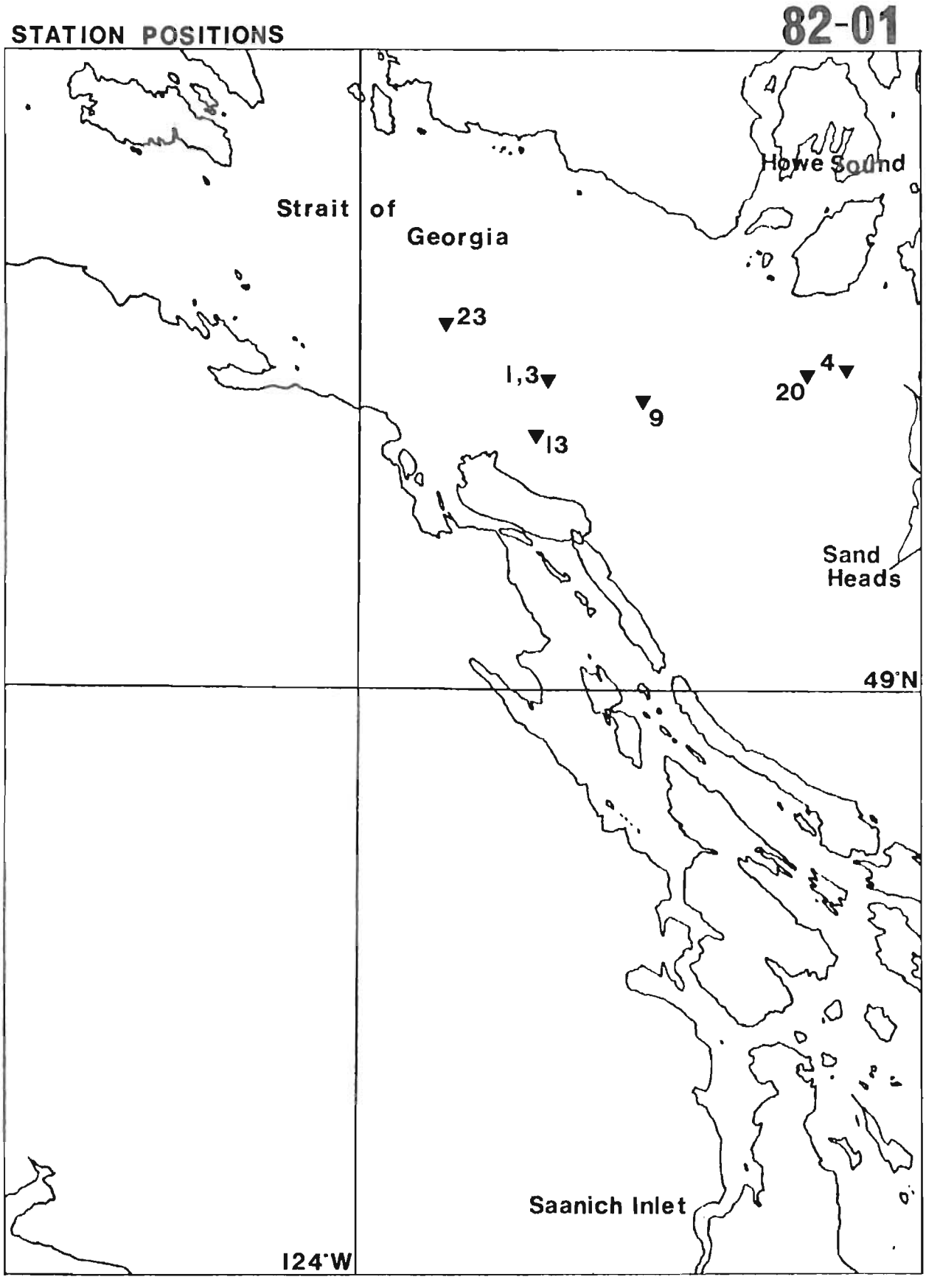


Fig. 1. Positions of stations for cruise 82-01.

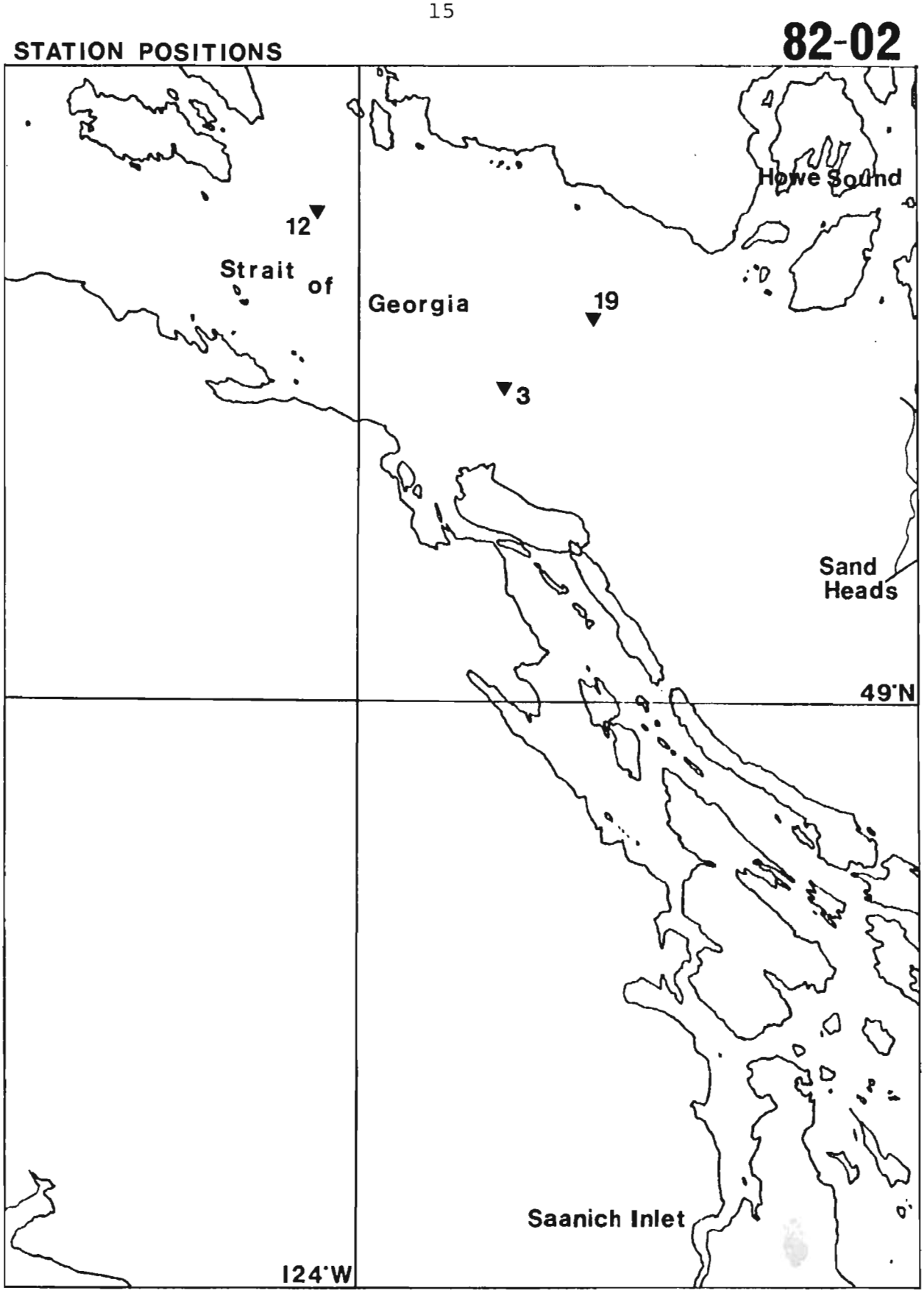


Fig. 2. Positions of stations for cruise 82-02.

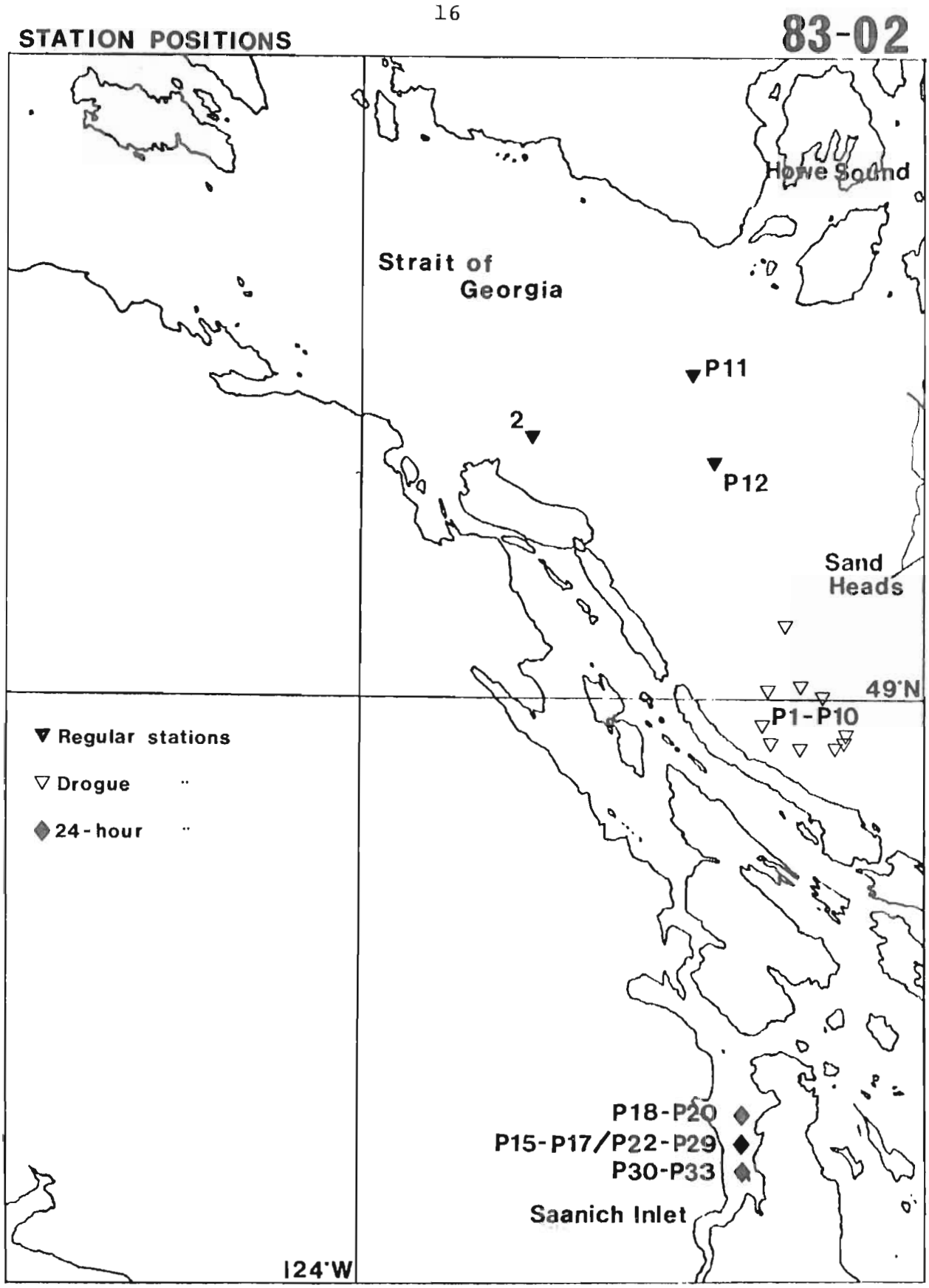


Fig. 3. Positions of stations for cruise 83-02.

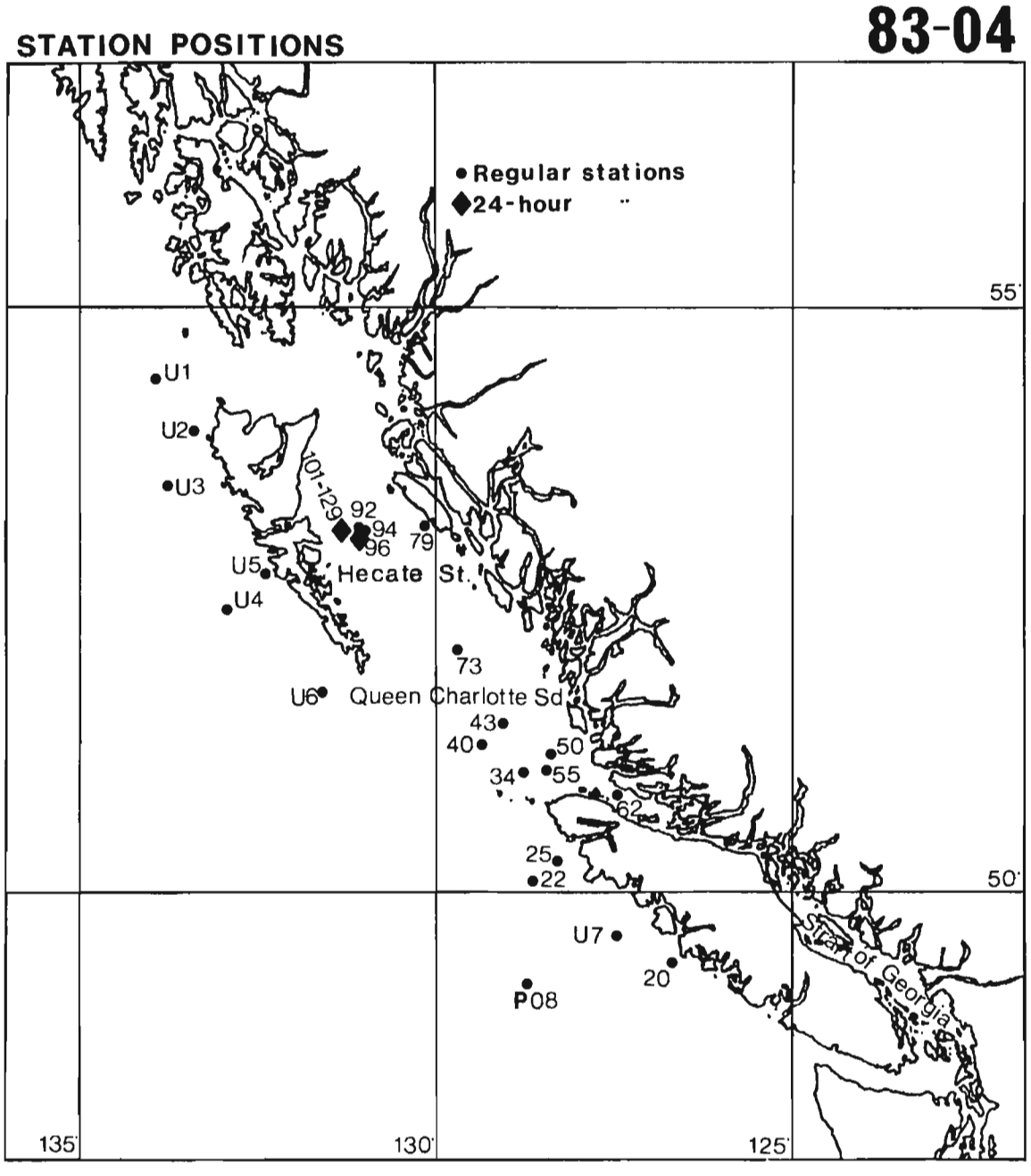


Fig. 4. Positions of stations for cruise 83-04. Stations marked U1 to U7 refer to stations 07.11/1452 to 07.15/1145 respectively (see p. 13).

CRUISE 82-01

P(I) data
Station data
Fitted and derived parameters
Plots of data and fitted curves

Cruise : 82-01 Station : 1
Depth : 9.3 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	747.1	9.67
2	979.6	10.75
3	398.5	10.00
4	431.7	8.11
5	431.7	8.54
6	182.6	8.23
7	182.6	8.65
8	199.2	8.80
9	84.7	6.31
10	102.9	6.72
11	102.9	5.41
12	41.5	7.23
13	41.5	2.56
14	41.5	2.79
15	19.9	.80
16	19.9	.90
17	19.9	1.58

Cruise : 82-01 Station : 3
Depth : 10.8 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	1826.3	6.45
2	2158.4	3.08
3	2324.4	3.33
4	830.2	7.88
5	929.8	7.93
6	996.2	8.12
7	365.3	8.56
8	415.1	8.49
9	448.3	8.44
10	166.0	7.82
11	166.0	7.71
12	199.2	7.79
13	83.0	4.67
14	93.0	4.82
15	102.9	4.73
16	38.2	2.16
17	39.8	2.51
18	44.8	2.21
19	9.0	.36
20	9.6	.31
21	10.6	.38

Cruise : 82-01 Station : 3
Depth : 7.5 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	1826.3	7.04
2	2158.4	10.44
3	2324.4	5.24
4	830.2	9.63
5	929.8	12.08
6	996.2	9.35
7	365.3	9.56
8	415.1	12.48
9	448.3	9.75
10	166.0	8.45
11	166.0	9.18
12	199.2	9.44
13	83.0	5.18
14	93.0	10.68
15	102.9	6.44
16	38.2	2.18
17	39.8	3.07
18	44.8	4.52
19	9.0	.25
20	9.6	3.23
21	10.6	1.12

Cruise : 82-01 Station : 4
Depth : 4.9 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	672.4	8.02
2	796.9	7.78
3	896.6	5.58
4	348.7	8.95
5	398.5	7.49
6	423.4	6.76
7	164.4	8.03
8	204.2	5.08
9	74.7	4.36
10	84.7	6.04
11	87.2	2.24
12	37.4	2.78
13	39.8	2.92
14	44.8	2.32
15	15.9	1.04
16	16.9	1.19
17	17.9	1.18
18	4.7	.12
19	5.0	.12
20	5.0	.15

Cruise : 82-01 Station : 9
Depth : 5.0 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	763.7	7.37
2	1062.6	4.13
3	1012.8	5.15
4	431.7	8.96
5	431.7	7.90
6	199.2	7.35
7	199.2	7.47
8	182.6	7.37
9	88.0	7.20
10	89.7	7.06
11	88.0	6.44
12	43.2	5.03
13	39.8	7.54
14	43.2	3.96
15	19.9	2.21
16	19.9	2.31
17	19.9	2.17
18	5.0	.56
19	5.0	.47
20	5.0	.86

Cruise : 82-01 Station : 13
Depth : 4.4 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	747.1	8.27
2	1012.8	6.60
3	1029.4	7.56
4	431.7	7.82
5	431.7	7.52
6	464.9	8.34
7	199.2	6.92
8	199.2	6.32
9	199.2	6.40
10	93.0	4.76
11	99.6	4.11
12	99.6	4.00
13	46.5	2.08
14	46.5	2.15
15	46.5	2.18
16	23.2	1.66
17	23.2	1.77
18	23.2	1.93
19	6.6	.15
20	6.6	.16
21	6.6	.38

Cruise : 82-01 Station : 20
Depth : 4.5 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	896.6	9.30
2	1095.8	6.96
3	1195.4	7.25
4	431.7	10.78
5	448.3	10.78
6	464.9	12.05
7	166.0	10.97
8	182.6	11.73
9	182.6	11.33
10	76.4	9.22
11	76.4	9.29
12	78.0	12.13
13	43.2	4.81
14	43.2	5.14
15	44.8	5.04
16	16.6	2.43
17	19.9	2.51
18	19.9	5.50
19	4.6	.41
20	5.0	.47
21	5.1	.43

Cruise : 82-01 Station : 23
Depth : 8.9 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	730.5	8.95
2	896.6	2.32
3	1046.0	1.69
4	431.7	5.24
5	498.1	5.21
6	531.3	4.53
7	215.8	5.34
8	215.8	6.56
9	232.4	12.66
10	83.0	9.15
11	91.3	8.48
12	91.3	9.18
13	44.8	6.12
14	44.8	9.49
15	46.5	5.97
16	21.6	3.15
17	21.6	2.95
18	5.5	.41
19	5.5	.44
20	5.5	.38

Cruise : 82-01 Station : 23
Depth : 4.4 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	730.5	14.64
2	896.6	12.01
3	1046.0	11.71
4	431.7	14.22
5	498.1	14.55
6	531.3	15.21
7	215.8	14.18
8	215.8	15.08
9	232.4	16.08
10	83.0	12.86
11	91.3	12.31
12	91.3	11.88
13	44.8	6.56
14	44.8	6.54
15	46.5	6.49
16	21.6	3.16
17	21.6	.48
18	21.6	3.47
19	5.5	.68
20	5.5	.69
21	5.5	.74

Cruise : 82-01	Date:	82.05.17	Depth:	9.3	m
Station: 1	Time:	1126 (LAT)	Chlorophyll a:	.87	mg.m-3
		1245 (PDT)	Dis. Inorg. C:	2.17E+04	mg.m-3

Final estimates +/- 90% confidence limits:

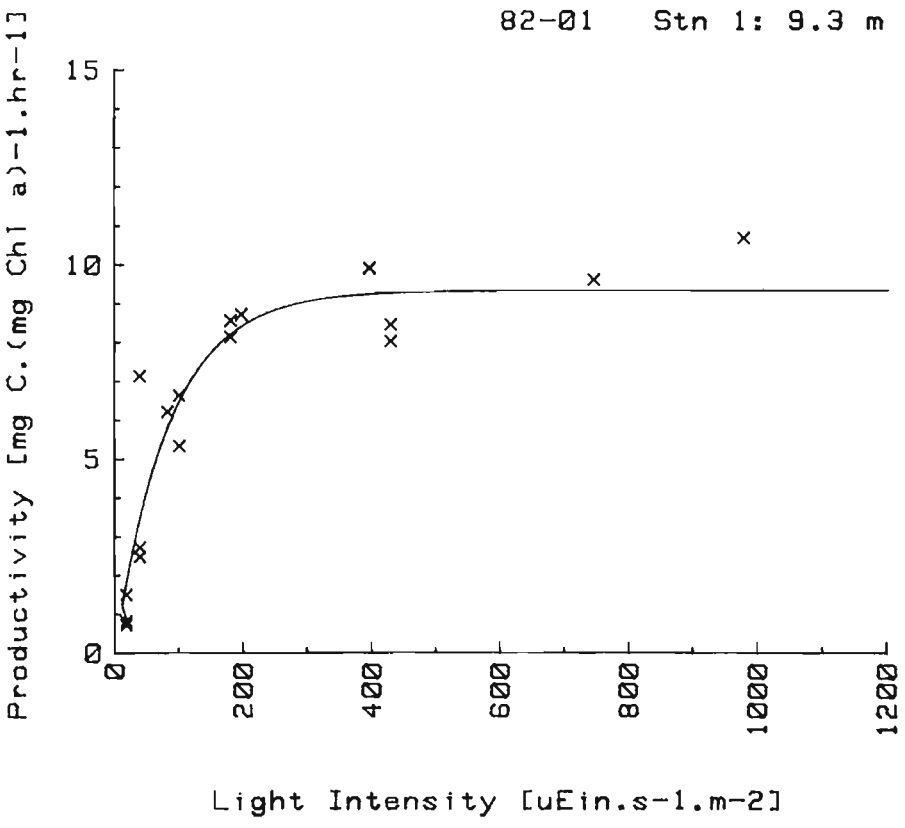
Psb	=	9.334	+/-	2.618
Alpha	=	.109	+/-	.035
Beta	=	.0000	+/-	.0042

Derived parameters:

Pm	=	9.33
Im	=	794.7
Is	=	85.5
Ib	=	9.33E+05

n = 17

r = .920 with 13 degrees of freedom


82-01 Stn 1: 9.3 m
Productivity [mg C.(mg Chl a)-1.hr-1]
15
10
5
0
0
200
400
600
800
1000
1200
Light Intensity [uEin.s-1.m-2]

```
Cruise : 82-01        Date:  82.05.17              Depth: 10.8       m
Station: 3            Time:  1720 (LAT)    Chlorophyll a:   .47      mg.m-3
                             1839 (PDT)    Dis. Inorg. C:  2.18E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   12.118   +/-   1.799
              Alpha =     .071   +/-    .009
              Beta  =     .0059  +/-    .0023


          Derived parameters:
                 Pm =    9.04
                 Im =  435.8
                 Is =  169.5
                 Ib =    2.05E+03

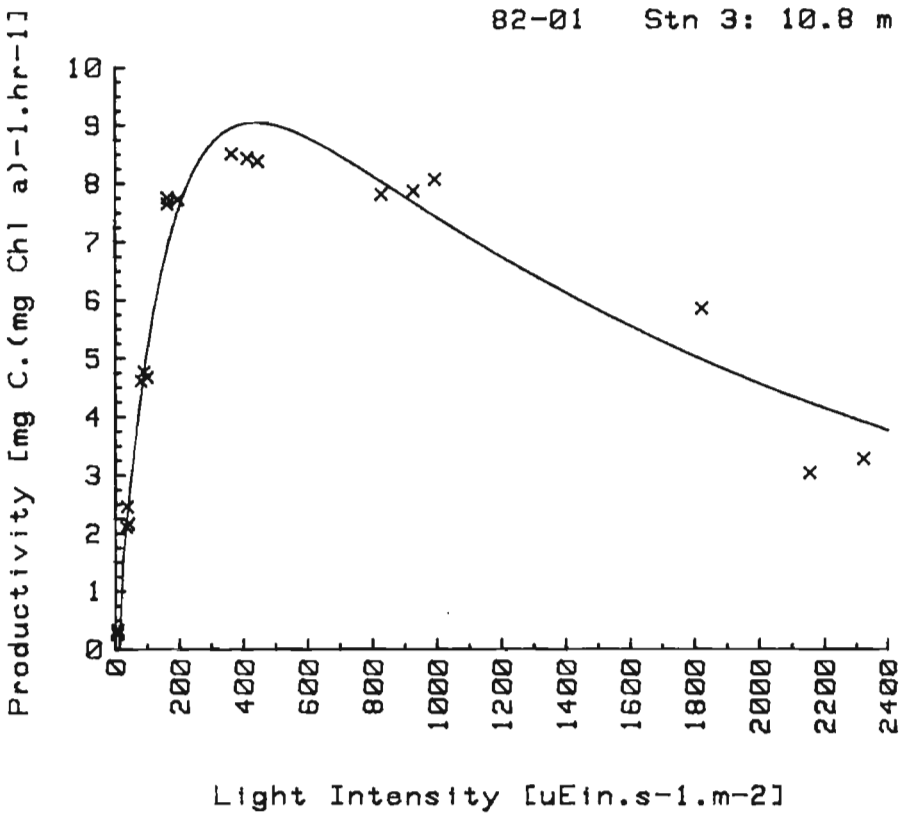

                 n =   21
                 r =     .977 with 17 degrees of freedom
```

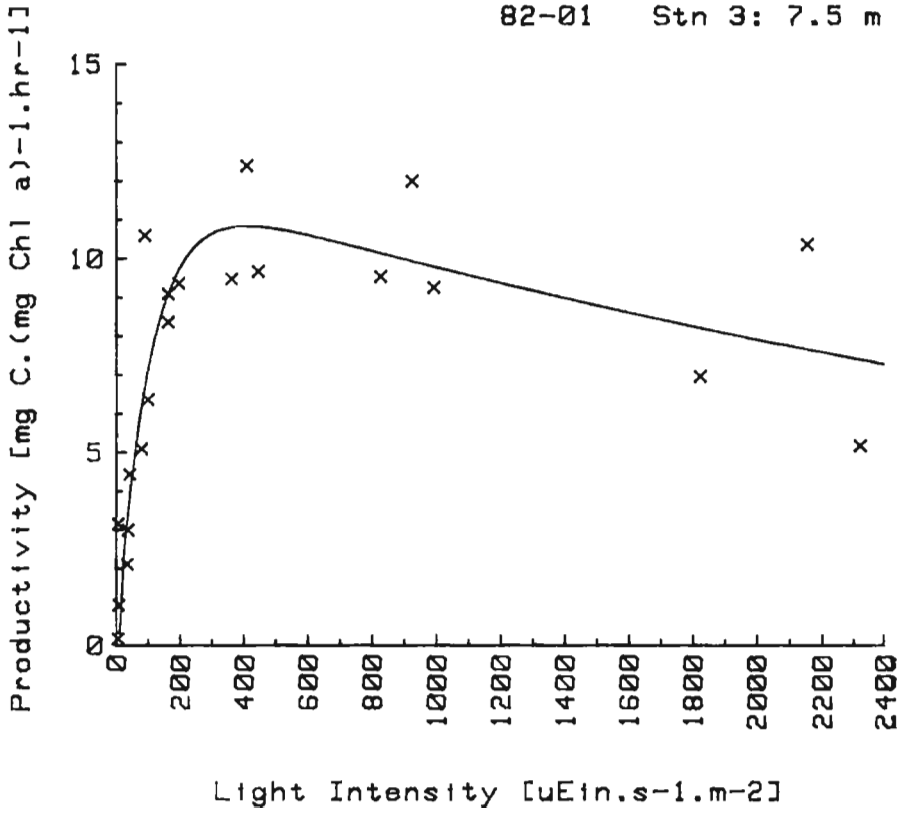
```
Cruise : 82-01        Date:  82.05.17              Depth:  7.5       m
Station: 3            Time:  1720 (LAT)    Chlorophyll a:  1.00      mg.m-3
                             1839 (PDT)    Dis. Inorg. C:  2.17E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   12.083   +/-   2.435
              Alpha =     .112   +/-    .033
              Beta  =     .0026  +/-    .0025


          Derived parameters:
                 Pm =   10.83
                 Im =  409.6
                 Is =  107.7
                 Ib =    4.72E+03


                 n =   21
                 r =     .891 with 17 degrees of freedom
```


82-01 Stn 3: 10.8 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
9
10
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
Light Intensity [uEin.s-1.m-2]


82-01 Stn 3: 7.5 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
5
10
15
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
Light Intensity [uEin.s-1.m-2]

Cruise : 82-01	Date:	82.05.18	Depth:	4.9	m
Station: 4	Time:	0637 (LAT)	Chlorophyll a:	1.56	mg.m-3
		0755 (PDT)	Dis. Inorg. C:	2.35E+04	mg.m-3

Final estimates +/- 90% confidence limits:

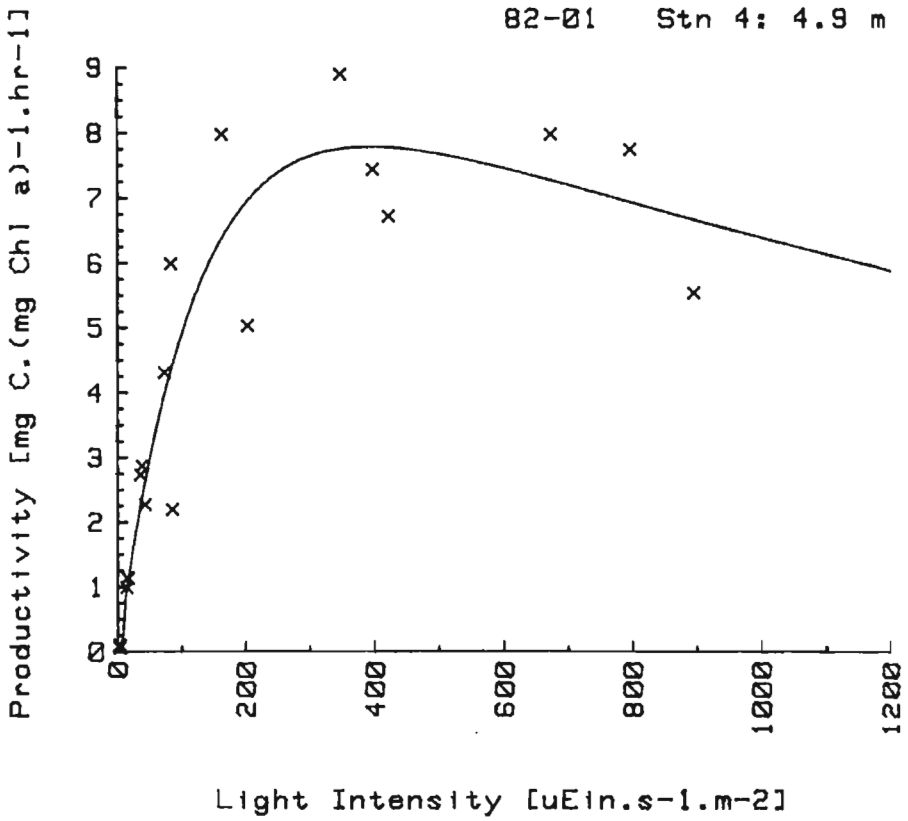
Psb	=	9.650	+/-	4.812
Alpha	=	.073	+/-	.021
Beta	=	.0040	+/-	.0089

Derived parameters:

Pm	=	7.78
Im	=	391.2
Is	=	132.3
Ib	=	2.41E+03

n = 20

r = .935 with 16 degrees of freedom


82-01 Stn 4: 4.9 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
9
0
200
400
600
800
1000
1200
Light Intensity [uEin.s-1.m-2]

Cruise : 82-01	Date:	82.05.18	Depth:	5.0	m
Station: 9	Time:	1413 (LAT)	Chlorophyll a:	1.79	mg.m-3
		1531 (PDT)	Dis. Inorg. C:	2.18E+04	mg.m-3

Final estimates +/- 90% confidence limits:

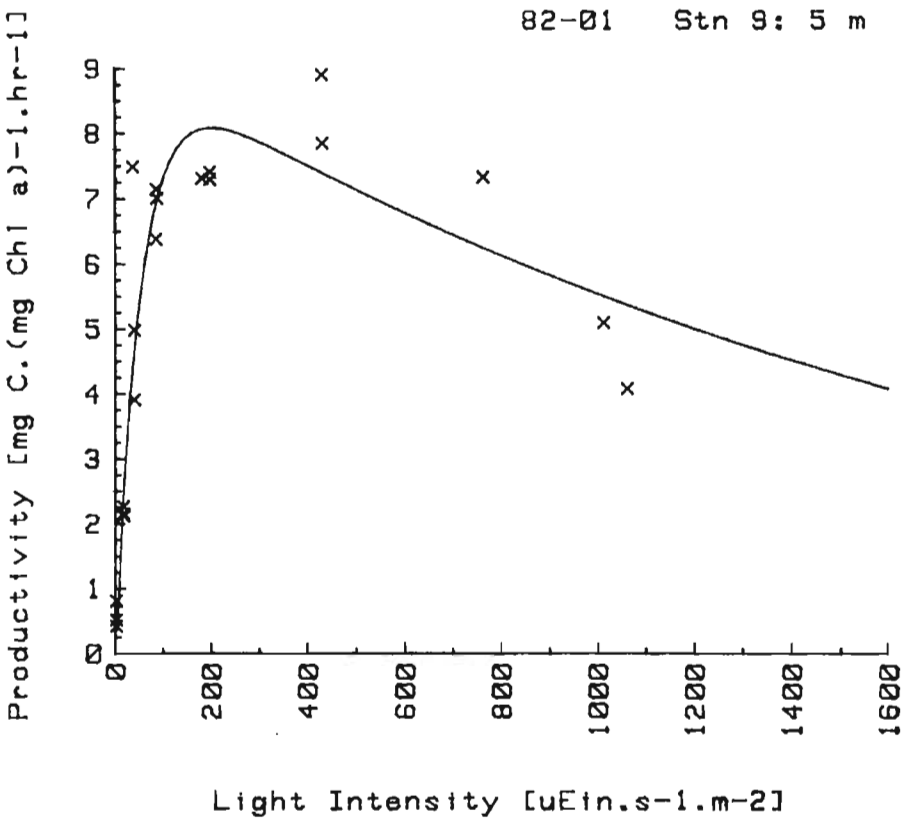
Psb	=	9.206	+/-	1.696
Alpha	=	.166	+/-	.041
Beta	=	.0047	+/-	.0037

Derived parameters:

Pm	=	8.09
Im	=	199.2
Is	=	55.4
Ib	=	1.96E+03

n = 20

r = .930 with 16 degrees of freedom


82-01 Stn 9: 5 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
9
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]

Cruise : 82-01	Date:	82.05.19	Depth:	4.4	m
Station: 13	Time:	0957 (LAT)	Chlorophyll a:	2.53	mg.m-3
		1116 (PDT)	Dis. Inorg. C:	2.16E+04	mg.m-3

Final estimates +/- 90% confidence limits:

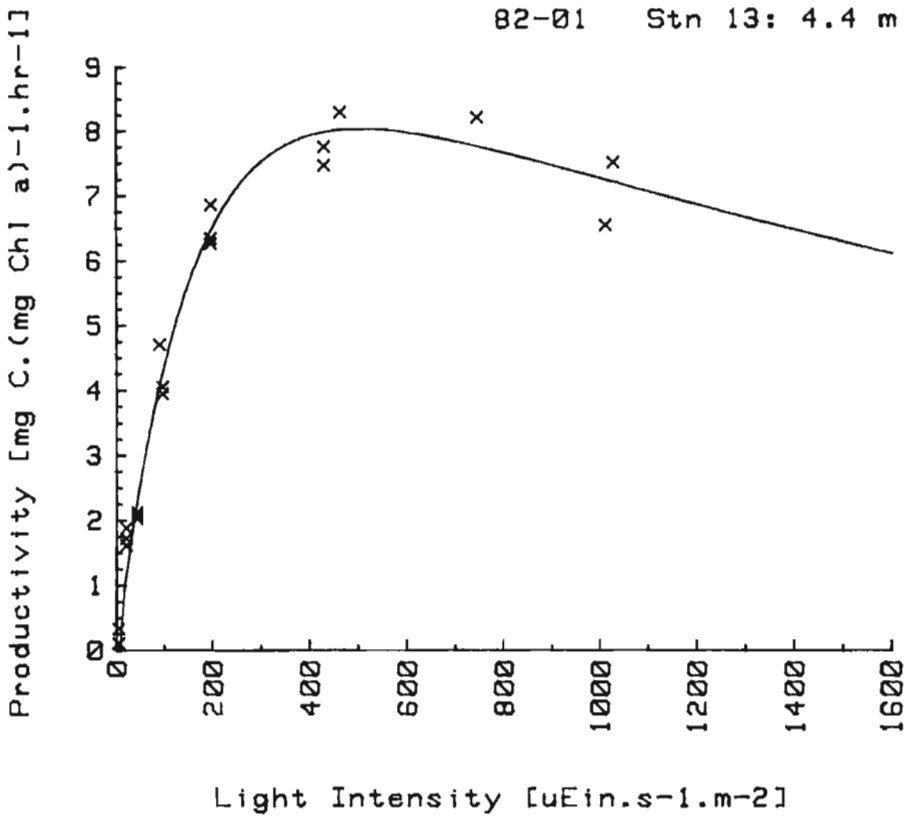
Psb	=	9.755	+/-	1.818
Alpha	=	.060	+/-	.006
Beta	=	.0029	+/-	.0027

Derived parameters:

Pm	=	8.04
Im	=	501.8
Is	=	162.4
Ib	=	3.41E+03

n = 21

r = .990 with 17 degrees of freedom


82-01 Stn 13: 4.4 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
9
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]

Cruise : 82-01	Date:	82.05.19	Depth:	4.5	m
Station: 20	Time:	1808 (LAT)	Chlorophyll a:	1.24	mg.m-3
		1926 (PDT)	Dis. Inorg. C:	2.02E+04	mg.m-3

Final estimates +/- 90% confidence limits:

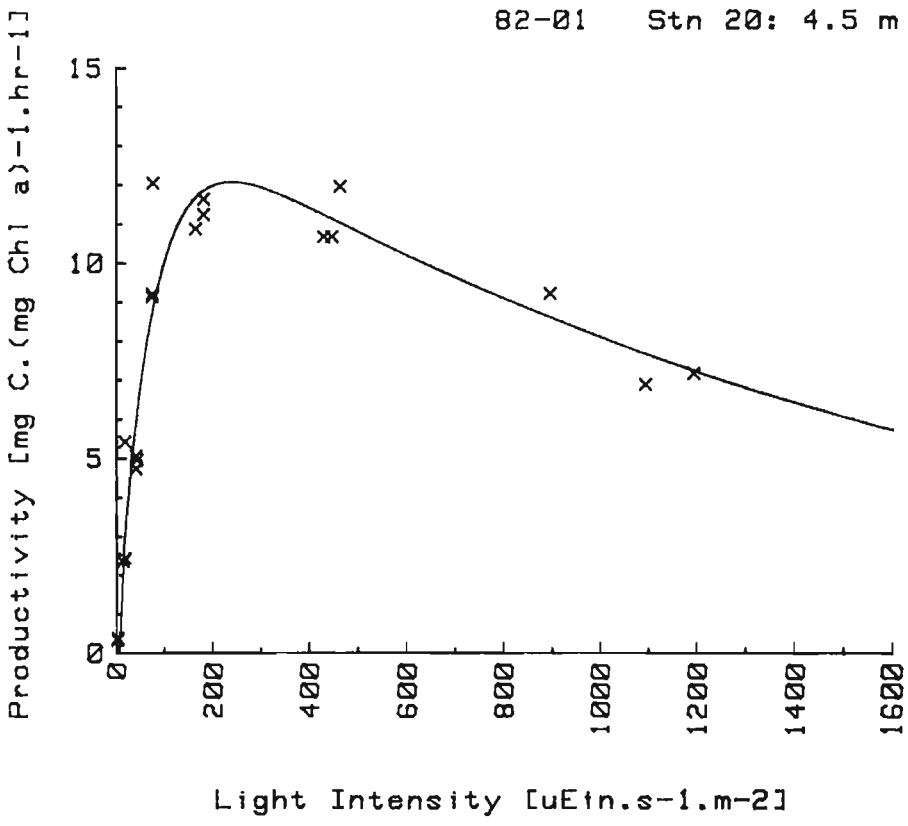
Psb	=	14.463	+/-	2.422
Alpha	=	.194	+/-	.035
Beta	=	.0084	+/-	.0050

Derived parameters:

Pm	=	12.08
Im	=	237.6
Is	=	74.7
Ib	=	1.72E+03

n = 21

r = .959 with 17 degrees of freedom


82-01 Stn 20: 4.5 m
Productivity [mg C.(mg Chl a)-1.hr-1]
15
10
5
0
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]

```
Cruise : 82-01        Date:  82.05.20              Depth:  8.9       m
Station: 23           Time:  0632 (LAT)    Chlorophyll a:   .24      mg.m-3
                             0752 (PDT)    Dis. Inorg. C:  2.28E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   11.267   +/-   4.370
              Alpha =     .243   +/-    .112
              Beta  =     .0148  +/-    .0155


          Derived parameters:
                 Pm =    8.92
                 Im =  132.6
                 Is =   46.4
                 Ib =    7.62E+02

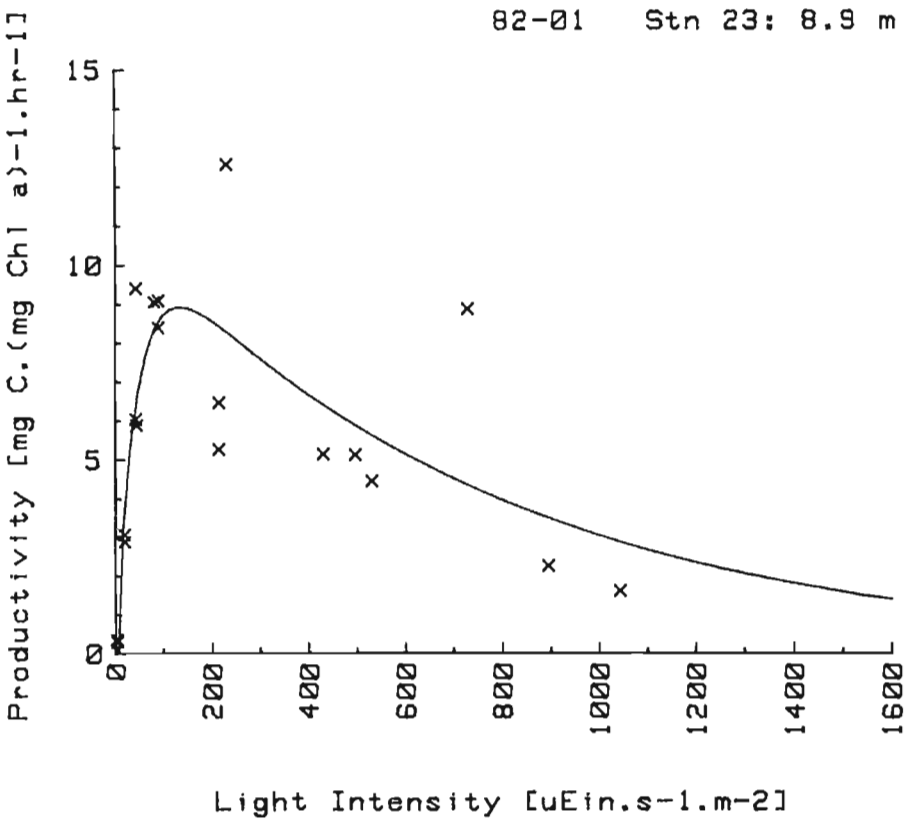

                 n =   20
                 r =     .803 with 16 degrees of freedom
```

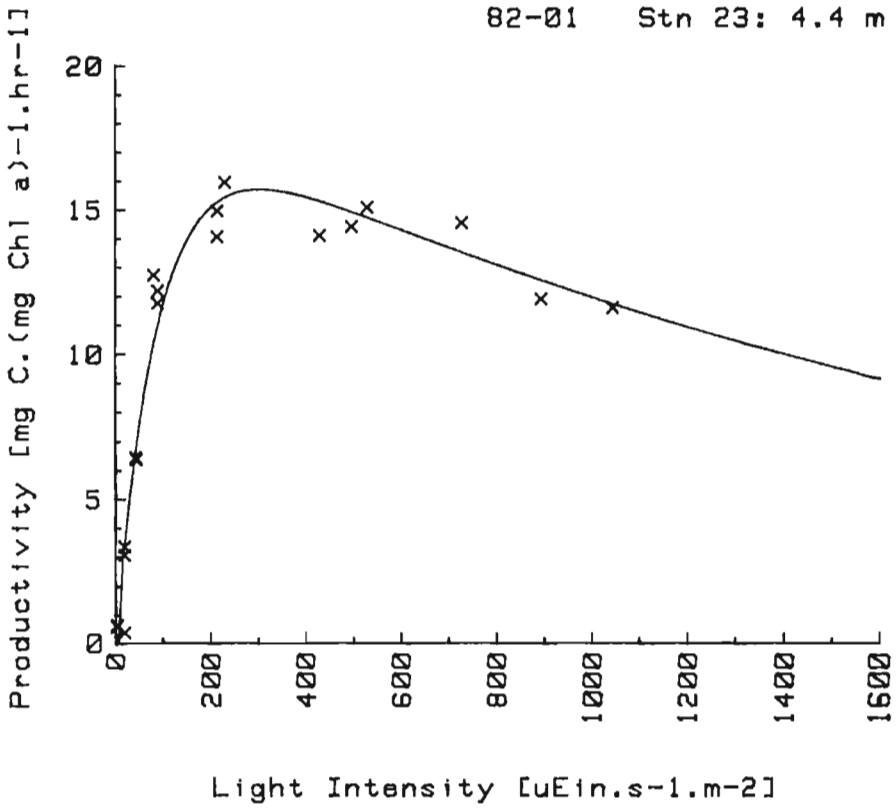
```
Cruise : 82-01        Date:  82.05.20              Depth:  4.4       m
Station: 23           Time:  0632 (LAT)    Chlorophyll a:  1.66      mg.m-3
                             0752 (PDT)    Dis. Inorg. C:  2.16E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   18.754   +/-   2.995
              Alpha =     .199   +/-    .029
              Beta  =     .0084  +/-    .0059


          Derived parameters:
                 Pm =   15.71
                 Im =  302.1
                 Is =   94.3
                 Ib =    2.23E+03


                 n =   21
                 r =     .979 with 17 degrees of freedom
```


82-01 Stn 23: 8.9 m
Productivity [mg C.(mg Chl a)-1.hr-1]
15
10
5
0
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]


82-01 Stn 23: 4.4 m
Productivity [mg C.(mg Chl a)-1.hr-1]
20
15
10
5
0
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]

CRUISE 82-02

P(I) data
Station data
Fitted and derived parameters
Plots of data and fitted curves

Cruise : 82-02 Station : 3
Depth : 10.1 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	730.5	4.13
2	863.4	3.99
3	979.6	4.05
4	365.3	3.78
5	431.7	4.02
6	464.9	3.95
7	182.6	3.05
8	199.2	2.92
9	215.8	2.87
10	86.3	1.53
11	89.7	1.63
12	96.3	1.58
13	39.8	.69
14	43.2	.70
15	44.8	.69
16	18.3	.37
17	19.9	.29
18	19.9	.27
19	4.3	.08
20	4.6	.05
21	5.0	.05

Cruise : 82-02 Station : 3
Depth : 3.2 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	730.5	2.25
2	863.4	2.76
3	979.6	3.14
4	365.3	2.55
5	431.7	2.76
6	464.9	2.84
7	182.6	2.00
8	199.2	2.11
9	215.8	2.17
10	86.3	1.20
11	89.7	1.18
12	96.3	1.18
13	39.8	.56
14	43.2	.55
15	44.8	.40
16	18.3	.21
17	19.9	.25
18	19.9	.20
19	4.3	.07
20	4.6	.05
21	5.0	.03

Cruise : 82-02 Station : 12
Depth : 9.5 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	1361.4	3.35
2	1361.4	3.40
3	780.3	3.88
4	830.2	3.46
5	348.7	3.43
6	166.0	2.97
7	182.6	2.98
8	199.2	3.14
9	83.0	1.79
10	83.0	1.80
11	88.0	1.66
12	36.5	.79
13	39.8	.96
14	46.5	.95
15	16.6	.42
16	19.9	.42
17	21.6	.44
18	4.8	.05
19	5.0	.05

Cruise : 82-02 Station : 19
Depth : 10.9 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	1062.6	3.24
2	1062.6	3.79
3	664.1	4.18
4	830.2	3.68
5	365.3	3.67
6	398.5	2.69
7	166.0	2.98
8	182.6	3.15
9	199.2	3.39
10	83.0	1.85
11	89.7	1.84
12	93.0	1.85
13	38.2	.91
14	39.8	.93
15	46.5	.92
16	16.6	.48
17	19.9	.44
18	6.1	.17
19	6.1	.15

```
Cruise : 82-02        Date:  82.07.13              Depth: 10.1       m
Station: 3            Time:  0916 (LAT)    Chlorophyll a:  3.64      mg.m-3
                             1025 (PDT)    Dis. Inorg. C:  1.91E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    5.944   +/-   2.346
              Alpha =     .022   +/-    .002
              Beta  =     .0023  +/-    .0031


          Derived parameters:
                 Pm =    4.19
                 Im =  645.6
                 Is =  275.9
                 Ib =    2.59E+03

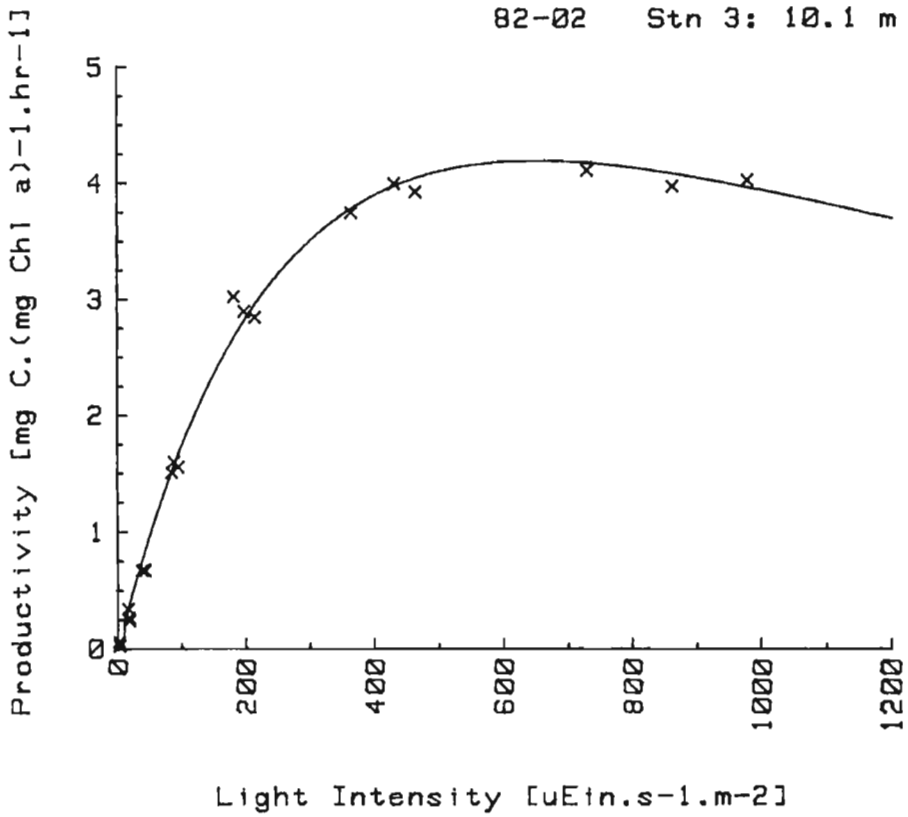

                 n =   21
                 r =     .997 with 17 degrees of freedom
```

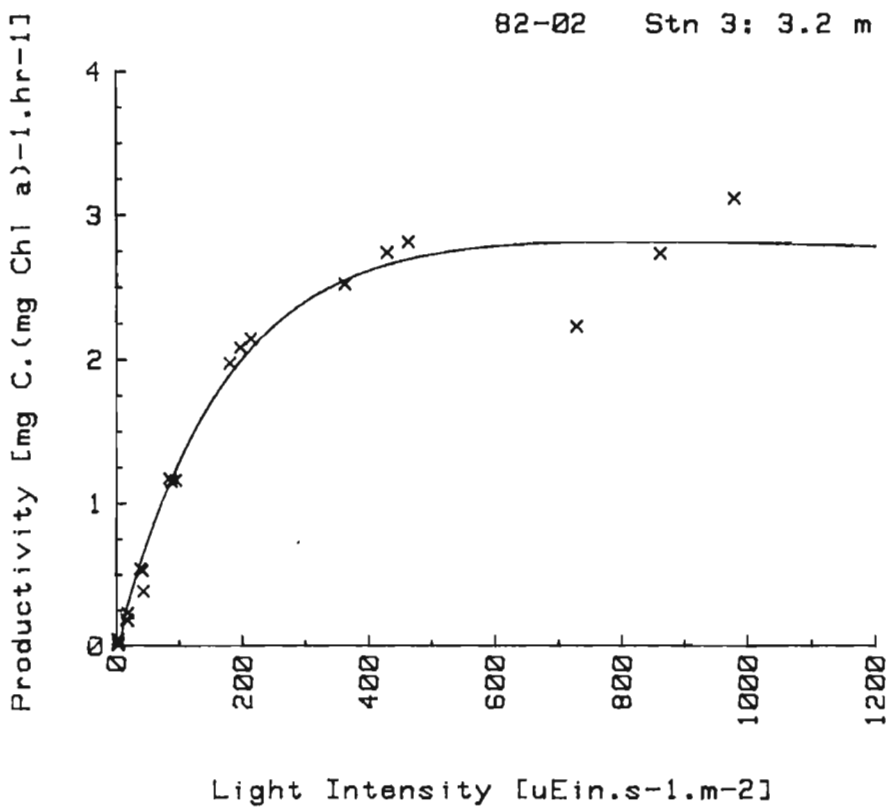
```
Cruise : 82-02        Date:  82.07.13              Depth:  3.2       m
Station: 3            Time:  0916 (LAT)    Chlorophyll a:  1.38      mg.m-3
                             1025 (PDT)    Dis. Inorg. C:  1.01E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    2.976   +/-    .902
              Alpha =     .017   +/-    .003
              Beta  =     .0002  +/-    .0011


          Derived parameters:
                 Pm =    2.82
                 Im =  813.1
                 Is =  175.2
                 Ib =    1.80E+04


                 n =   21
                 r =     .986 with 17 degrees of freedom
```


82-02 Stn 3: 10.1 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
0
200
400
600
800
1000
1200
Light Intensity [uEin.s-1.m-2]


82-02 Stn 3: 3.2 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
0
200
400
600
800
1000
1200
Light Intensity [uEin.s-1.m-2]

Cruise : 82-02	Date:	82.07.14	Depth:	9.5	m
Station: 12	Time:	1605 (LAT)	Chlorophyll a:	7.47	mg.m-3
		1715 (PDT)	Dis. Inorg. C:	2.00E+04	mg.m-3

Final estimates +/- 90% confidence limits:

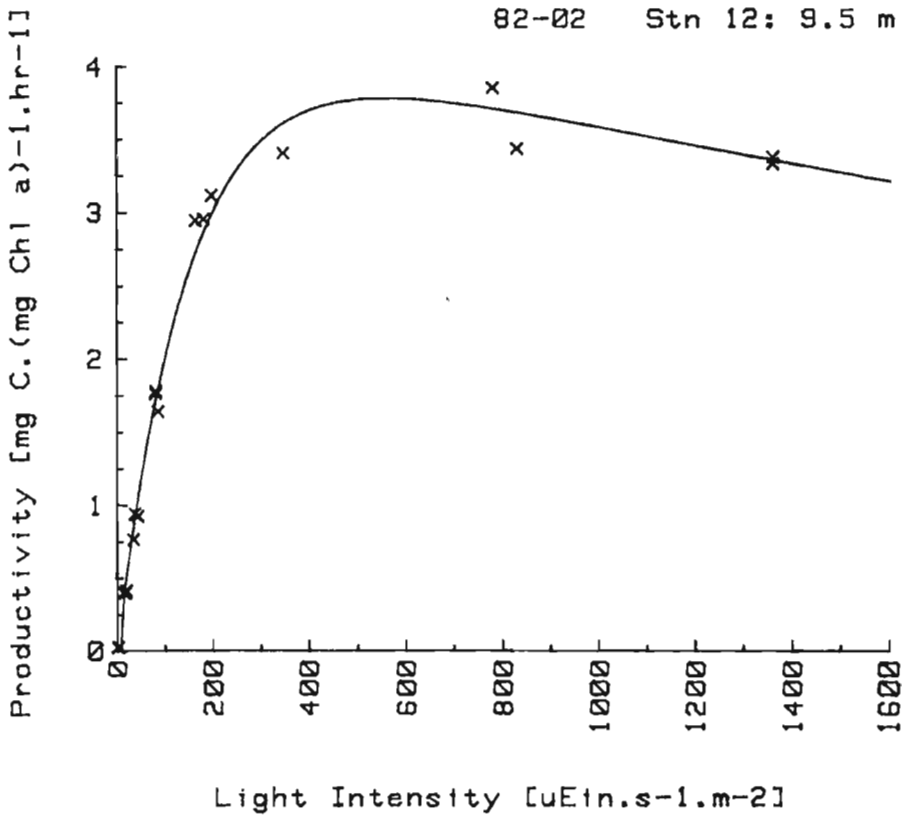
Psb	=	4.306	+/-	.495
Alpha	=	.028	+/-	.002
Beta	=	.0008	+/-	.0005

Derived parameters:

Pm	=	3.78
Im	=	556.2
Is	=	155.2
Ib	=	5.44E+03

n = 19

r = .995 with 15 degrees of freedom


82-02 Stn 12: 9.5 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]

Cruise : 82-02	Date:	82.07.15	Depth:	10.9	m
Station: 19	Time:	0705 (LAT)	Chlorophyll a:	3.32	mg.m-3
		0814 (PDT)	Dis. Inorg. C:	2.11E+04	mg.m-3

Final estimates +/- 90% confidence limits:

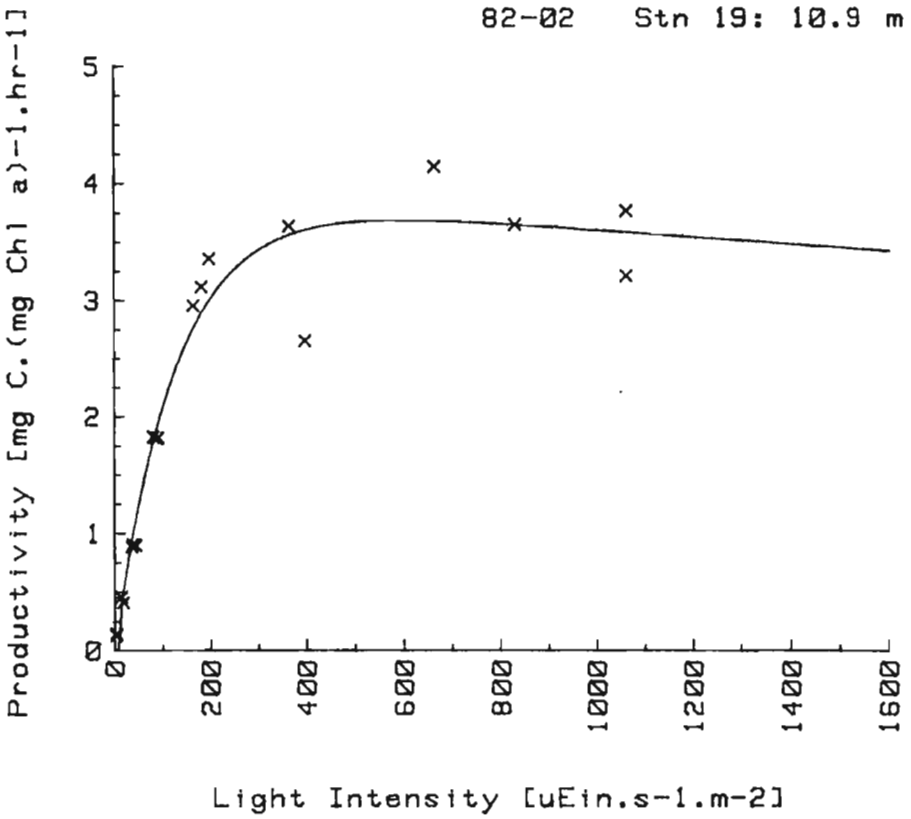
Psb	=	3.923	+/-	.974
Alpha	=	.030	+/-	.006
Beta	=	.0003	+/-	.0012

Derived parameters:

Pm	=	3.69
Im	=	590.0
Is	=	131.1
Ib	=	1.17E+04

n = 19

r = .973 with 15 degrees of freedom


82-02 Stn 19: 10.9 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]

CRUISE 83-02

P(I) data
Station data
Fitted and derived parameters
Plots of data and fitted curves

Cruise : 83-02 Station : 2
Depth : 4.3 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	18.30
2	1401.3	17.34
3	1726.7	18.14
4	481.5	16.72
5	747.1	17.94
6	838.5	19.16
7	245.7	15.88
8	352.0	13.04
9	391.8	15.82
10	78.5	5.26
11	98.3	5.24
12	105.3	6.36
13	38.5	2.06
14	45.8	2.16
15	49.8	2.86
16	18.4	1.08
17	20.6	1.04
18	22.9	.72
19	8.1	.92
20	8.7	.90
21	9.4	.82

Cruise : 83-02 Station : P-01
Depth : 1.6 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	15.06
2	1401.3	14.28
3	1726.7	15.28
4	481.5	15.32
5	747.1	15.98
6	838.5	16.06
7	245.7	14.98
8	352.0	15.32
9	391.8	14.52
10	78.5	7.30
11	98.3	7.56
12	105.3	7.40
13	38.5	3.44
14	45.8	3.36
15	49.8	4.44
16	18.4	1.66
17	20.6	1.36
18	22.9	1.56
19	8.1	.74
20	8.7	.76
21	9.4	.98

Cruise : 83-02 Station : P-02
Depth : 4.3 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	13.90
2	1401.3	14.64
3	1726.7	14.62
4	481.5	14.94
5	747.1	16.14
6	838.5	16.04
7	245.7	8.10
8	352.0	15.76
9	391.8	14.90
10	78.5	7.42
11	98.3	7.64
12	105.3	7.74
13	38.5	3.38
14	45.8	3.12
15	49.8	3.56
16	18.4	1.42
17	20.6	1.46
18	22.9	1.22
19	8.1	.98
20	8.7	.70
21	9.4	.66

Cruise : 83-02 Station : P-03
Depth : 3.9 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	11.18
2	1401.3	10.60
3	1726.7	11.08
4	481.5	9.38
5	747.1	12.68
6	838.5	12.94
7	245.7	12.38
8	352.0	10.88
9	391.8	10.44
10	78.5	4.82
11	98.3	5.00
12	105.3	4.76
13	38.5	2.26
14	45.8	2.20
15	49.5	2.52
16	18.4	.30
17	20.6	.60
18	22.9	.86
19	8.1	.22
20	8.7	.12
21	9.4	.26

Cruise : 83-02 Station : P-04
Depth : 3.1 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	7.64
2	1401.3	7.60
3	1726.7	8.14
4	481.5	9.46
5	747.1	9.60
6	838.5	9.32
7	245.7	9.08
8	352.0	9.10
9	391.8	8.80
10	78.5	4.34
11	98.3	4.74
12	105.3	4.70
13	38.5	1.76
14	45.8	1.96
15	49.8	2.20
16	18.4	.30
17	20.6	.40
18	22.9	.44
19	8.1	.12
20	8.7	.28
21	9.4	.18

Cruise : 83-02 Station : P-05
Depth : 2.7 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	5.88
2	1401.3	5.38
3	1726.7	6.00
4	481.5	7.36
5	747.1	7.44
6	838.5	7.18
7	245.7	8.08
8	391.8	7.76
9	78.5	7.10
10	98.3	4.06
11	105.3	3.94
12	38.5	1.68
13	45.8	1.90
14	49.8	2.08
15	18.4	.56
16	20.6	.60
17	22.9	.62
18	8.1	.14
19	8.7	.18
20	9.4	.16

Cruise : 83-02 Station : P-06
Depth : 0.0 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	6.02
2	1401.3	4.54
3	1726.7	5.52
4	481.5	6.64
5	747.1	7.70
6	838.5	8.46
7	245.7	8.34
8	352.0	8.18
9	391.8	7.72
10	78.5	3.66
11	98.3	3.64
12	105.3	3.94
13	38.5	1.44
14	45.8	1.68
15	49.8	1.86
16	18.4	.36
17	20.6	.36
18	22.9	.44
19	8.1	.02
20	8.7	.02
21	9.4	.02

Cruise : 83-02 Station : P-07
Depth : 0.0 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	8.20
2	1401.3	6.98
3	1726.7	7.90
4	481.5	9.50
5	745.1	8.52
6	838.5	7.24
7	245.7	9.12
8	352.0	8.78
9	391.8	8.38
10	78.5	4.42
11	98.3	4.70
12	105.3	4.72
13	38.5	1.80
14	45.8	2.12
15	49.8	2.30
16	18.4	.50
17	20.6	.84
18	22.9	.68
19	8.1	.32
20	8.7	.30
21	9.4	.28

Cruise : 83-02 Station : P-08
Depth : 2.3 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	11.66
2	1401.3	10.92
3	1726.7	11.34
4	481.5	12.70
5	747.1	11.94
6	838.5	12.90
7	245.7	13.66
8	352.0	11.90
9	391.8	12.82
10	78.5	5.20
11	98.3	5.64
12	105.3	6.00
13	38.5	2.66
14	45.8	2.76
15	49.8	3.18
16	18.4	1.52
17	20.6	.88
18	22.9	.94
19	8.1	1.04
20	8.7	.70
21	9.4	1.06

Cruise : 83-02 Station : P-09
Depth : 3.0 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	10.36
2	1401.3	10.18
3	1726.7	11.12
4	481.5	11.48
5	747.1	10.78
6	838.5	11.52
7	245.7	9.50
8	352.0	10.12
9	391.8	10.10
10	78.5	4.28
11	98.3	4.38
12	105.3	5.00
13	38.5	2.26
14	45.8	2.32
15	49.8	2.44
16	18.4	1.28
17	20.6	1.18
18	22.9	1.12
19	8.1	.76
20	8.7	.66
21	9.4	.70

Cruise : 83-02 Station : P-10
Depth : 2.7 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	11.46
2	1401.3	12.28
3	1726.7	12.24
4	481.5	12.20
5	747.1	12.66
6	838.5	13.12
7	245.7	12.80
8	352.0	12.38
9	78.5	6.40
10	98.3	5.46
11	105.3	6.10
12	38.5	2.60
13	45.8	2.66
14	49.8	2.80
15	18.4	1.04
16	20.6	1.06
17	22.9	1.02
18	8.1	.50
19	8.7	.44
20	9.4	.46

Cruise : 83-02 Station : P-11
Depth : 4.4 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	8.52
2	1401.3	6.54
3	1726.7	7.04
4	481.5	9.46
5	747.1	9.68
6	838.5	8.92
7	245.7	11.28
8	352.0	11.24
9	391.8	10.88
10	78.5	5.52
11	98.3	6.14
12	105.3	6.78
13	38.5	2.96
14	45.8	3.14
15	49.8	3.50
16	18.4	1.62
17	20.6	1.40
18	22.9	1.96
19	8.1	.80
20	8.7	.80
21	9.4	.84

Cruise : 83-02 Station : P-12
Depth : 5.3 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	15.28
2	1401.3	13.84
3	1726.7	15.00
4	481.5	15.90
5	747.1	16.28
6	838.5	15.56
7	245.7	15.90
8	352.0	15.52
9	391.8	15.20
10	78.5	7.02
11	98.3	7.30
12	105.3	8.32
13	38.5	3.26
14	45.8	3.24
15	49.8	3.68
16	18.4	1.82
17	20.6	1.64
18	22.9	1.64
19	8.1	.46
20	8.7	1.04
21	9.4	1.04

Cruise : 83-02 Station : P-15
Depth : 15.0 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	3.72
2	1401.0	1.84
3	1726.7	2.32
4	481.5	3.60
5	747.1	4.38
6	838.5	4.28
7	245.7	3.90
8	352.0	4.36
9	391.8	4.38
10	78.5	2.14
11	98.3	1.86
12	105.3	1.96
13	38.5	1.26
14	45.8	1.04
15	49.8	1.06
16	18.4	.48
17	20.6	.54
18	22.9	.54
19	8.1	.46
20	9.4	.36

Cruise : 83-02 Station : 15
Depth : 6.4 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	536.3	5.76
2	966.3	5.14
3	1132.3	4.66
4	295.5	5.18
5	443.3	5.60
6	518.0	5.00
7	147.8	4.66
8	240.7	3.78
9	257.3	3.72
10	56.5	1.72
11	70.6	1.60
12	74.7	1.66
13	27.4	.90
14	32.7	1.12
15	34.5	1.14
16	15.5	.76
17	17.1	.58
18	18.4	.46
19	7.3	.40
20	8.0	.32
21	8.3	.20

Cruise : 83-02 Station : 16
Depth : 14.3 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	536.3	5.30
2	966.3	4.74
3	1132.3	5.08
4	443.3	4.58
5	518.0	4.76
6	147.8	4.80
7	240.7	5.02
8	257.3	4.62
9	56.5	2.20
10	70.6	2.14
11	74.7	2.04
12	27.4	1.42
13	32.7	1.44
14	34.5	1.28
15	15.5	.86
16	17.1	.72
17	18.4	.70
18	7.3	1.62
19	8.0	1.36
20	8.3	1.32

Cruise : 83-02 Station : P-16
Depth : 7.2 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	7.16
2	1401.3	6.36
3	1726.7	6.06
4	481.5	6.62
5	747.1	7.10
6	838.5	7.00
7	245.7	7.46
8	352.0	6.96
9	391.8	6.88
10	78.5	3.32
11	98.3	3.14
12	105.3	3.20
13	38.5	2.20
14	45.8	1.96
15	49.8	1.56
16	18.4	1.64
17	20.6	1.40
18	22.9	1.58
19	8.1	1.02
20	8.7	.76
21	9.4	.72

Cruise : 83-02 Station : P-17
Depth : 13.6 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	536.3	4.96
2	966.3	4.20
3	1132.3	4.38
4	295.5	3.22
5	443.3	3.46
6	518.0	3.10
7	147.8	3.02
8	240.7	5.00
9	257.3	4.98
10	56.5	2.98
11	70.6	2.92
12	74.7	2.88
13	27.4	1.52
14	32.7	1.60
15	34.5	1.44
16	15.5	.98
17	17.1	.88
18	18.4	.74
19	7.3	.40
20	8.0	.36
21	8.3	.32

Cruise : 83-02 Station : P-17
Depth : 6.7 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	5.08
2	1401.3	3.86
3	1726.7	3.82
4	481.5	5.20
5	747.1	5.10
6	838.5	4.92
7	245.7	5.68
8	352.0	5.34
9	391.8	5.12
10	78.5	2.90
11	98.3	2.98
12	105.3	3.08
13	38.5	1.72
14	45.8	1.68
15	49.8	1.58
16	18.4	.94
17	20.6	.82
18	22.9	.84
19	8.1	.54
20	8.7	.44
21	9.4	.10

Cruise : 83-02 Station : P-18
Depth : 14.2 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	536.3	6.82
2	966.3	6.66
3	1132.3	6.70
4	295.5	7.44
5	443.3	7.56
6	518.0	7.34
7	147.8	7.14
8	240.7	7.40
9	257.3	7.48
10	56.5	2.96
11	70.6	3.02
12	74.7	3.40
13	27.4	1.88
14	32.7	1.92
15	34.5	1.60
16	15.5	1.04
17	17.1	.88
18	18.4	.92
19	7.3	.64
20	8.0	.58
21	8.3	.54

Cruise : 83-02 Station : P-18
Depth : 5.2 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	7.64
2	1401.3	7.12
3	1726.7	4.50
4	481.5	5.44
5	747.1	7.86
6	838.5	6.36
7	245.7	6.86
8	352.0	6.30
9	391.8	7.02
10	78.5	3.04
11	98.3	2.82
12	105.3	3.02
13	45.8	1.36
14	49.8	1.54
15	18.4	.84
16	20.6	.72
17	22.9	.72
18	8.1	.40
19	8.7	.42
20	9.4	.46

Cruise : 83-02 Station : P-19
Depth : 14.2 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	536.3	2.76
2	966.3	2.58
3	1132.3	2.60
4	295.5	2.64
5	443.3	2.44
6	518.0	2.32
7	147.8	3.38
8	240.7	3.16
9	257.3	3.30
10	56.5	.78
11	70.6	1.56
12	74.7	1.40
13	27.4	1.08
14	32.7	.94
15	34.5	.80
16	15.5	.48
17	17.1	.32
18	18.4	.34
19	7.3	.28
20	8.0	.34
21	8.3	.26

Cruise : 83-02 Station : P-19
Depth : 5.2 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	1401.3	2.78
2	1726.7	2.92
3	481.5	3.38
4	747.1	3.18
5	838.5	3.02
6	245.7	3.12
7	352.0	2.94
8	391.8	3.02
9	78.5	1.38
10	98.3	1.56
11	105.3	1.70
12	38.5	.80
13	45.8	.34
14	49.8	.36
15	18.4	.22
16	20.6	.18
17	22.9	.12
18	8.1	.06
19	8.7	.04
20	9.4	.04

Cruise : 83-02 Station : P-20
Depth : 14.4 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	536.3	5.94
2	966.3	5.86
3	1132.3	5.64
4	295.5	6.36
5	443.3	6.50
6	518.0	5.20
7	147.8	4.54
8	240.7	5.86
9	56.5	3.12
10	70.6	2.98
11	74.7	2.94
12	27.4	1.70
13	32.7	1.64
14	34.5	1.66
15	15.5	1.00
16	17.1	.82
17	18.4	1.02
18	7.3	.58
19	8.0	.42
20	8.3	.56

Cruise : 83-02 Station : P-20
Depth : 5.5 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	9.52
2	1401.3	9.50
3	1726.7	10.44
4	481.5	10.52
5	747.1	9.90
6	838.5	9.40
7	245.7	9.74
8	352.0	8.08
9	391.8	9.36
10	78.5	3.48
11	98.3	3.00
12	105.3	3.56
13	38.5	1.64
14	45.8	1.64
15	49.8	1.66
16	18.4	.94
17	20.6	.78
18	22.9	.80
19	8.1	.54
20	8.7	.60
21	9.4	.48

Cruise : 83-02 Station : P-22
Depth : 4.1 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	1401.3	5.74
2	1726.7	6.04
3	481.5	6.12
4	747.1	6.38
5	838.5	5.96
6	245.7	6.48
7	352.0	5.50
8	391.8	5.90
9	78.5	2.74
10	98.3	2.68
11	105.3	3.08
12	38.5	1.28
13	45.8	1.16
14	49.8	1.24
15	18.4	.46
16	20.6	.36
17	22.9	.44
18	8.1	.10
19	8.7	.12
20	9.4	.12

Cruise : 83-02 Station : P-23
Depth : 8.3 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	2.90
2	1401.3	2.86
3	1726.7	3.22
4	481.5	3.56
5	747.1	3.66
6	838.5	3.54
7	245.7	3.64
8	352.0	3.62
9	391.8	3.72
10	78.5	2.20
11	98.3	1.48
12	105.3	2.40
13	38.5	1.06
14	45.8	1.02
15	49.8	1.04
16	18.4	.40
17	20.6	.40
18	22.9	.36
19	8.1	.08
20	8.7	.10
21	9.4	.08

Cruise : 83-02 Station : P-24
Depth : 7.2 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	3.72
2	1401.3	3.28
3	1726.7	3.52
4	481.5	4.16
5	747.1	4.18
6	838.5	4.10
7	245.7	4.22
8	352.0	3.84
9	391.8	3.80
10	78.5	2.54
11	98.3	2.52
12	105.3	2.36
13	38.5	1.14
14	45.8	1.06
15	49.8	1.12
16	18.4	.42
17	20.6	.44
18	22.9	.44
19	8.1	.10
20	8.7	.12
21	9.4	.10

Cruise : 83-02 Station : P-25
Depth : 6.3 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	4.10
2	1401.3	3.48
3	1726.7	3.32
4	481.5	3.80
5	747.1	4.06
6	838.5	4.22
7	245.7	4.20
8	352.0	4.38
9	391.8	4.08
10	78.5	2.78
11	98.3	2.58
12	105.3	2.70
13	38.5	1.24
14	45.8	1.18
15	49.8	.58
16	18.4	.44
17	20.6	.44
18	22.9	.16
19	8.1	.12
20	8.7	.14
21	9.4	.14

Cruise : 83-02 Station : P-26
Depth : 6.4 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	3.94
2	1401.3	3.16
3	1726.7	3.18
4	481.5	4.18
5	747.1	4.08
6	838.5	4.12
7	245.7	4.12
8	352.0	4.30
9	391.8	4.10
10	78.5	2.54
11	98.3	2.40
12	105.3	2.44
13	38.5	1.12
14	45.8	1.12
15	49.8	1.18
16	18.4	.66
17	20.6	.58
18	22.9	.54
19	8.1	.36
20	8.7	.32
21	9.4	.32

Cruise : 83-02 Station : P-27
Depth : 5.1 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	5.44
2	1401.3	4.84
3	1726.7	6.32
4	481.5	6.14
5	747.1	5.72
6	838.5	5.10
7	245.7	7.56
8	352.0	6.34
9	391.8	5.98
10	78.5	3.36
11	98.3	2.86
12	105.3	3.90
13	38.5	1.56
14	45.8	1.58
15	49.8	1.54
16	18.4	.82
17	20.6	.68
18	22.9	.86
19	8.1	.50
20	9.4	.32
21	9.4	.32

Cruise : 83-02 Station : P-28
Depth : 10.1 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	6.46
2	1401.3	5.42
3	1726.7	5.80
4	481.5	8.54
5	747.1	6.74
6	838.5	7.34
7	245.7	7.28
8	352.0	8.76
9	391.8	8.68
10	78.5	4.78
11	98.3	4.12
12	105.3	4.90
13	38.5	2.32
14	45.8	2.22
15	49.8	2.38
16	18.4	1.44
17	20.6	1.02
18	22.9	1.32
19	8.1	.56
20	8.7	.48
21	9.4	.44

Cruise : 83-02 Station : P-29
Depth : 9.3 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	1401.3	2.96
2	1726.7	2.96
3	481.5	4.20
4	747.1	3.94
5	838.5	3.98
6	245.7	4.24
7	352.0	3.92
8	391.8	3.92
9	78.5	2.50
10	98.3	2.52
11	105.3	2.58
12	38.5	1.32
13	45.8	1.34
14	49.8	1.26
15	18.4	.72
16	20.6	.68
17	22.9	.68
18	8.1	.40
19	8.7	.34
20	9.4	.32

Cruise : 83-02 Station : P-30
Depth : 8.0 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	1.08
2	1401.3	1.04
3	1726.7	.94
4	481.5	1.10
5	747.1	1.08
6	838.5	1.10
7	245.7	1.14
8	352.0	.96
9	391.0	1.04
10	78.5	.84
11	98.3	1.00
12	105.3	1.04
13	38.5	.52
14	45.8	.46
15	49.8	.50
16	18.4	.20
17	20.6	.14
18	22.9	.18
19	8.1	.04
20	8.7	.04
21	9.4	.06

Cruise : 83-02 Station : P-31
Depth : 7.0 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	2.72
2	1401.3	2.34
3	1726.7	2.66
4	481.5	2.66
5	747.1	2.74
6	838.5	2.34
7	245.7	2.76
8	352.0	2.18
9	391.8	2.94
10	78.5	2.38
11	98.3	2.44
12	105.3	2.58
13	38.5	1.56
14	45.8	1.26
15	49.8	1.42
16	18.4	.56
17	20.6	.44
18	22.9	.52
19	8.1	.08
20	8.7	.22
21	9.4	.10

Cruise : 83-02 Station : P-32
Depth : 7.1 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	2.08
2	1401.3	1.90
3	1726.7	1.70
4	481.5	2.18
5	747.1	1.94
6	838.5	2.18
7	245.7	2.36
8	352.0	2.08
9	391.8	2.24
10	78.5	1.66
11	98.3	1.58
12	105.3	1.58
13	38.5	.78
14	45.8	.74
15	49.8	.80
16	18.4	.28
17	20.6	.38
18	22.9	.32
19	8.1	.12
20	8.7	.12
21	9.4	.14

Cruise : 83-02 Station : P-33
Depth : 8.7 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	871.7	3.04
2	1401.3	2.20
3	1726.7	2.58
4	481.5	3.40
5	747.1	3.12
6	838.5	3.48
7	245.7	3.56
8	352.0	2.58
9	391.8	2.86
10	78.5	1.76
11	98.3	2.00
12	105.3	2.20
13	38.5	.94
14	45.8	.98
15	49.8	1.00
16	18.4	.72
17	20.6	.46
18	22.9	.42
19	8.1	.24
20	8.7	.18
21	9.4	.20

Cruise : 83-02	Date:	83.05.17	Depth:	4.3	m
Station: 2	Time:	0806 (LAT)	Chlorophyll a:	1.80	mg.m-3
		0915 (PDT)	Dis. Inorg. C:	1.94E+04	mg.m-3

Final estimates +/- 90% confidence limits:

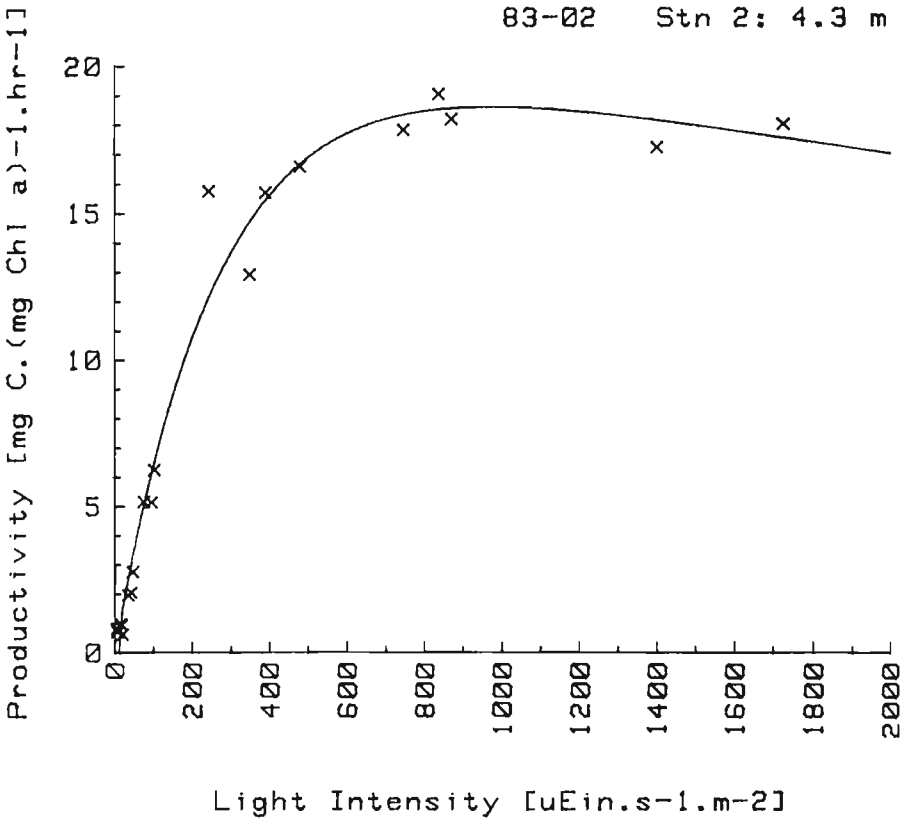
Psb	=	21.499	+/-	5.258
Alpha	=	.077	+/-	.012
Beta	=	.0025	+/-	.0044

Derived parameters:

Pm	=	18.61
Im	=	964.9
Is	=	279.0
Ib	=	8.58E+03

n = 21

r = .989 with 17 degrees of freedom


83-02 Stn 2: 4.3 m
Productivity [mg C.(mg Chl a)-1.hr-1]
20
15
10
5
0
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-02        Date:  83.05.18              Depth:  1.6       m
Station: P-01         Time:  0918 (LAT)    Chlorophyll a:  1.40      mg.m-3
                             1036 (PDT)    Dis. Inorg. C:  1.89E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   17.339   +/-   1.575
              Alpha =     .106   +/-    .011
              Beta  =     .0018  +/-    .0016


          Derived parameters:
                 Pm =   15.92
                 Im =  669.7
                 Is =  163.2
                 Ib =    9.73E+03

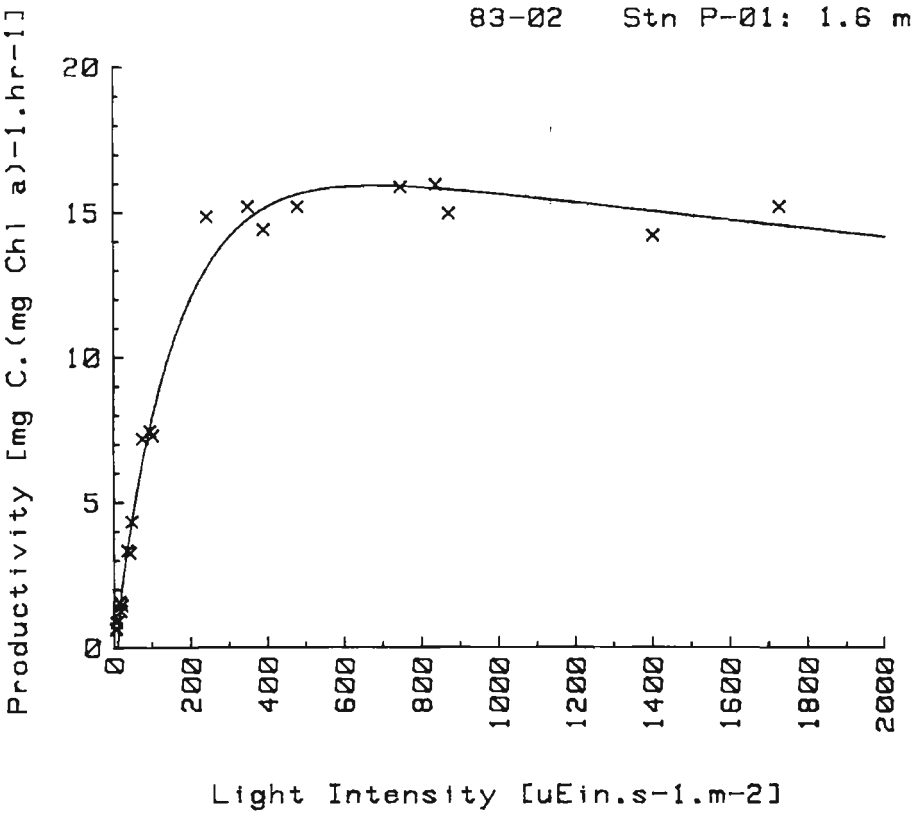

                 n =   21
                 r =     .994 with 17 degrees of freedom
```

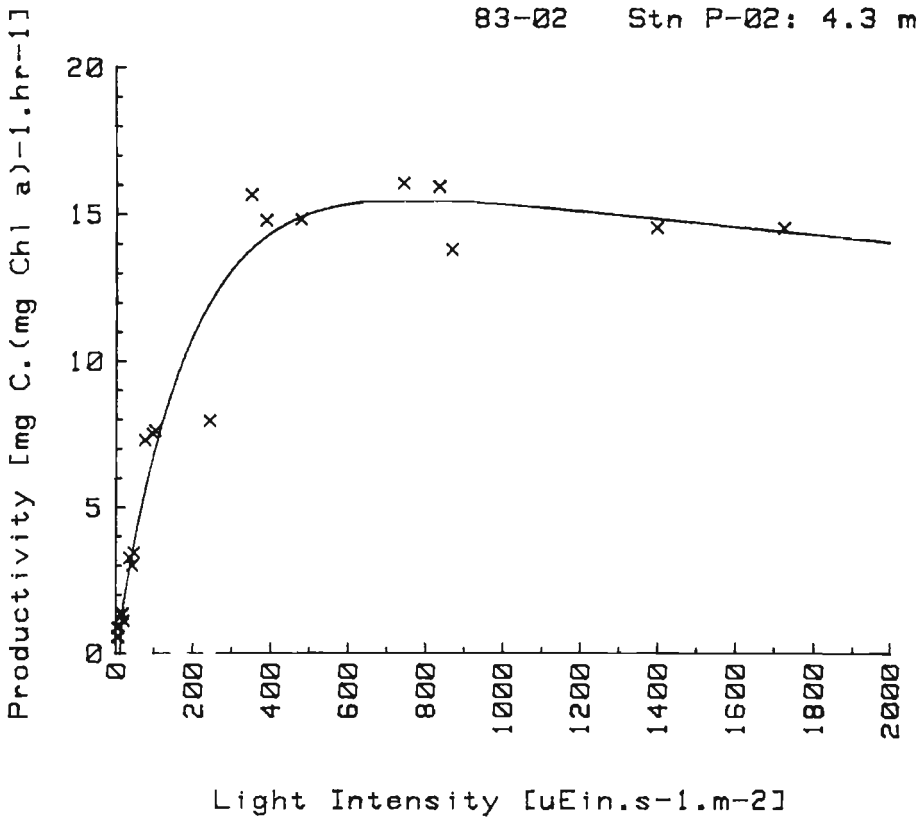
```
Cruise : 83-02        Date:  83.05.18              Depth:  4.3       m
Station: P-02         Time:  1221 (LAT)    Chlorophyll a:  1.59      mg.m-3
                             1339 (PDT)    Dis. Inorg. C:  1.82E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   16.920   +/-   3.261
              Alpha =     .090   +/-    .017
              Beta  =     .0016  +/-    .0031


          Derived parameters:
                 Pm =   15.47
                 Im =  763.0
                 Is =  188.4
                 Ib =    1.06E+04


                 n =   21
                 r =     .979 with 17 degrees of freedom
```


83-02 Stn P-01: 1.6 m
Productivity [mg C.(mg Chl a)-1.hr-1]
20
15
10
5
0
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]


83-02 Stn P-02: 4.3 m
Productivity [mg C.(mg Chl a)-1.hr-1]
20
15
10
5
0
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-02        Date:  83.05.18              Depth:  3.9       m
Station: P-03         Time:  1507 (LAT)    Chlorophyll a:  1.84      mg.m-3
                             1655 (PDT)    Dis. Inorg. C:  1.93E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   13.475   +/-   3.097
              Alpha =     .068   +/-    .014
              Beta  =     .0018  +/-    .0030


          Derived parameters:
                 Pm =   11.93
                 Im =  726.4
                 Is =  197.9
                 Ib =    7.58E+03

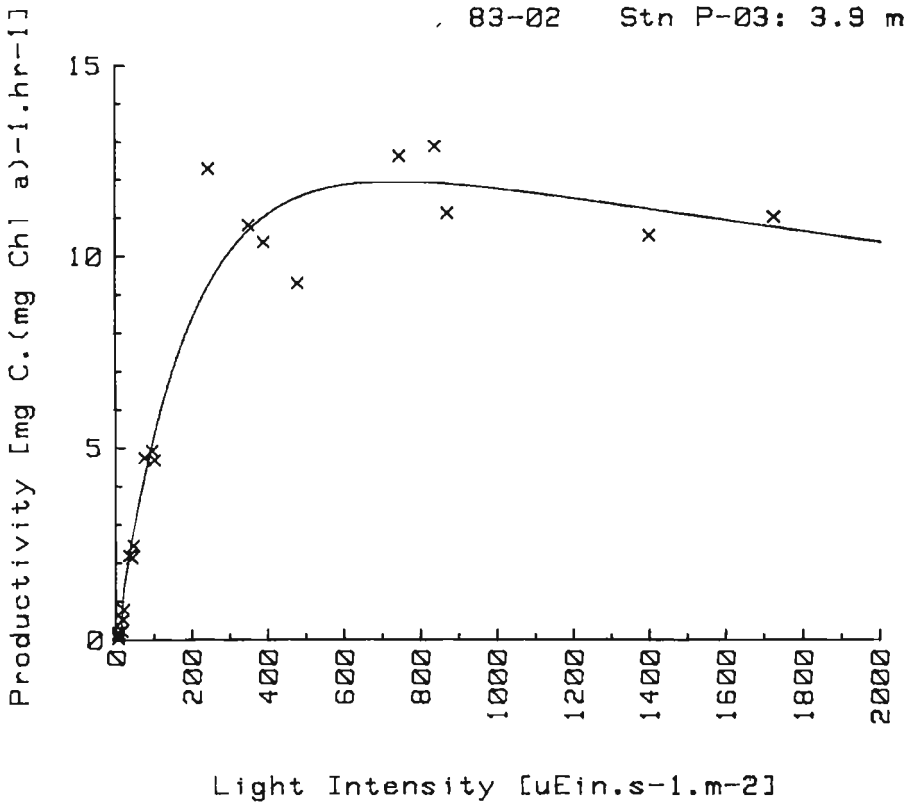

                 n =   21
                 r =     .977 with 17 degrees of freedom
```

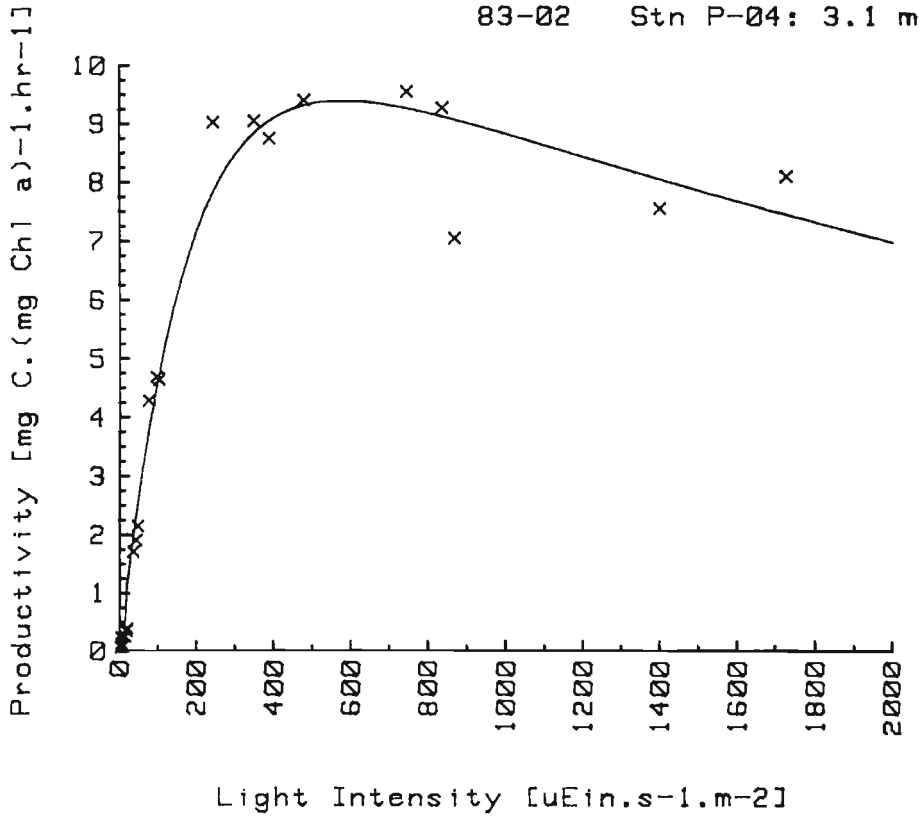
```
Cruise : 83-02        Date:  83.05.18              Depth:  3.1       m
Station: P-04         Time:  1833 (LAT)    Chlorophyll a:  1.87      mg.m-3
                             1951 (PDT)    Dis. Inorg. C:  2.42E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   11.260   +/-   1.916
              Alpha =     .062   +/-    .010
              Beta  =     .0027  +/-    .0022


          Derived parameters:
                 Pm =    9.39
                 Im =  577.1
                 Is =  182.1
                 Ib =    4.15E+03


                 n =   21
                 r =     .985 with 17 degrees of freedom
```


83-02 Stn P-03: 3.9 m
Productivity [mg C.(mg Chl a)-1.hr-1]
15
10
5
0
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]


83-02 Stn P-04: 3.1 m
Productivity [mg C.(mg Chl a)-1.hr-1]
10
9
8
7
6
5
4
3
2
1
0
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-02        Date:  83.05.18              Depth:  2.7       m
Station: P-05         Time:  2119 (LAT)    Chlorophyll a:  1.69      mg.m-3
                             2237 (PDT)    Dis. Inorg. C:  1.82E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    9.242   +/-   2.537
              Alpha =     .067   +/-    .018
              Beta  =     .0030  +/-    .0034


          Derived parameters:
                 Pm =    7.68
                 Im =  431.6
                 Is =  137.2
                 Ib =    3.05E+03

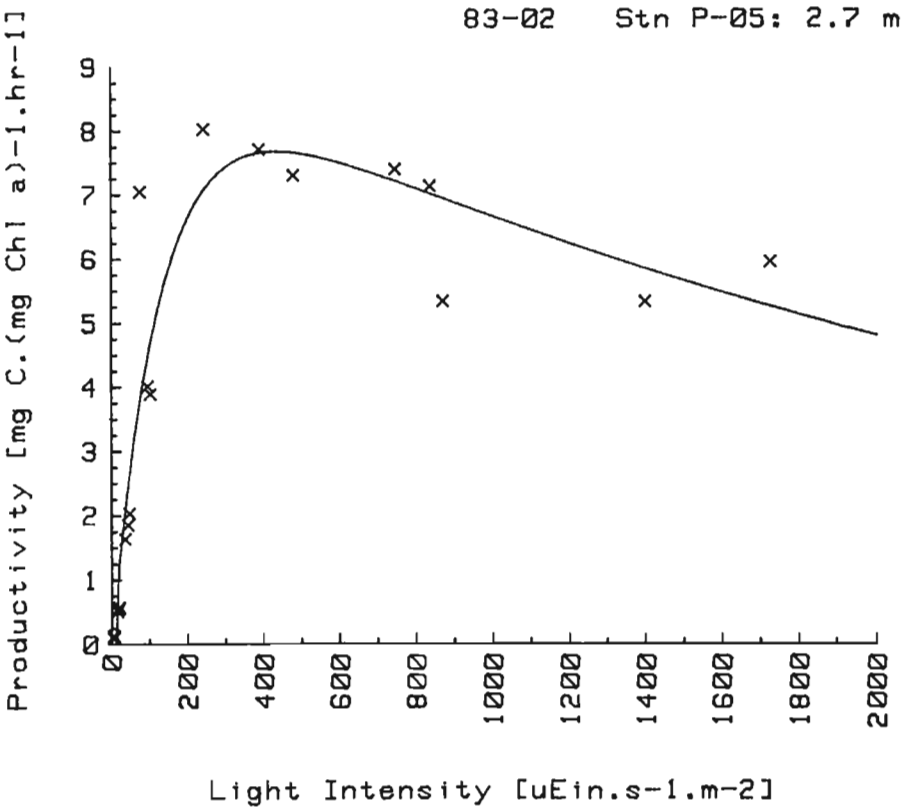

                 n =   20
                 r =     .943 with 16 degrees of freedom
```

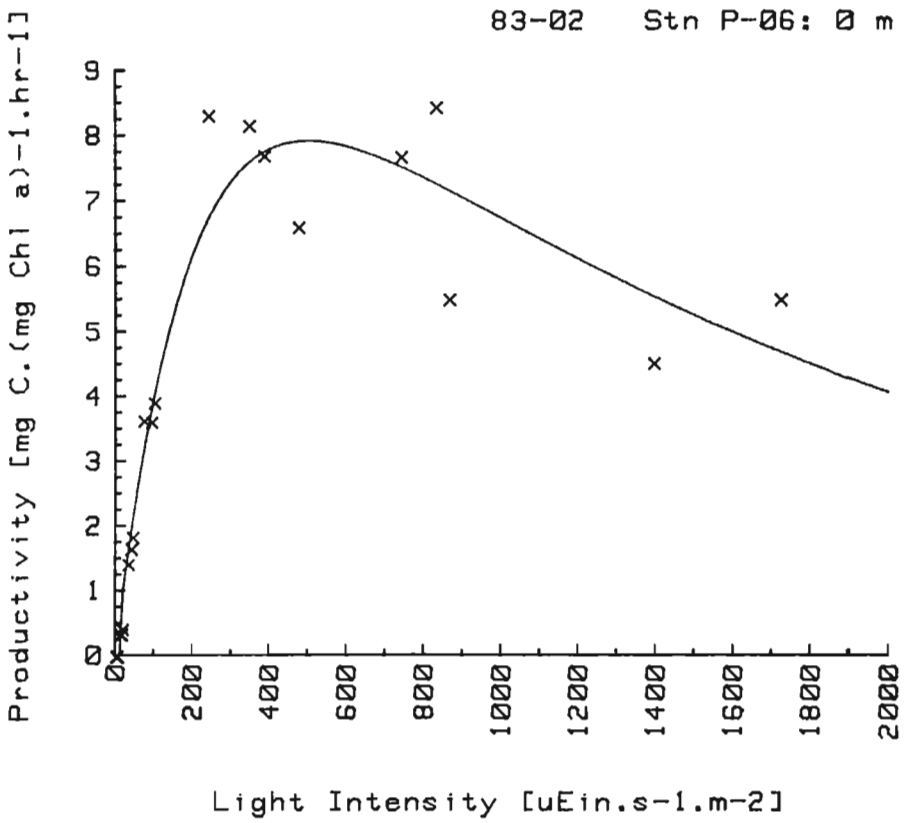
```
Cruise : 83-02        Date:  83.05.19              Depth:  0.0       m
Station: P-06         Time:  0022 (LAT)    Chlorophyll a:  1.36      mg.m-3
                             0140 (PDT)    Dis. Inorg. C:  1.81E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   11.416   +/-   4.125
              Alpha =     .052   +/-    .011
              Beta  =     .0059  +/-    .0057


          Derived parameters:
                 Pm =    7.91
                 Im =  501.1
                 Is =  219.6
                 Ib =    1.93E+03


                 n =   21
                 r =     .968 with 17 degrees of freedom
```


83-02 Stn P-05: 2.7 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
9
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]


83-02 Stn P-06: 0 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
9
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-02        Date:  83.05.19              Depth:  0.0       m
Station: P-07         Time:  0328 (LAT)    Chlorophyll a:  1.26      mg.m-3
                             0446 (PDT)    Dis. Inorg. C:  1.75E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   10.350   +/-   1.584
              Alpha =     .066   +/-    .010
              Beta  =     .0024  +/-    .0019


          Derived parameters:
                 Pm =    8.84
                 Im =  526.8
                 Is =  157.3
                 Ib =    4.33E+03

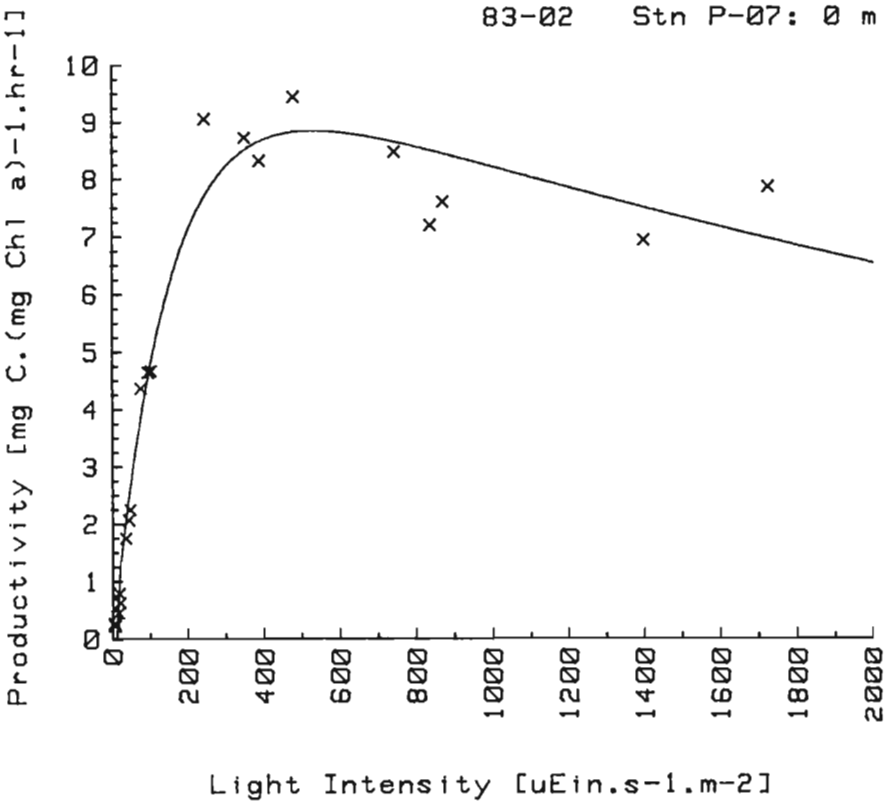

                 n =   21
                 r =     .983 with 17 degrees of freedom
```

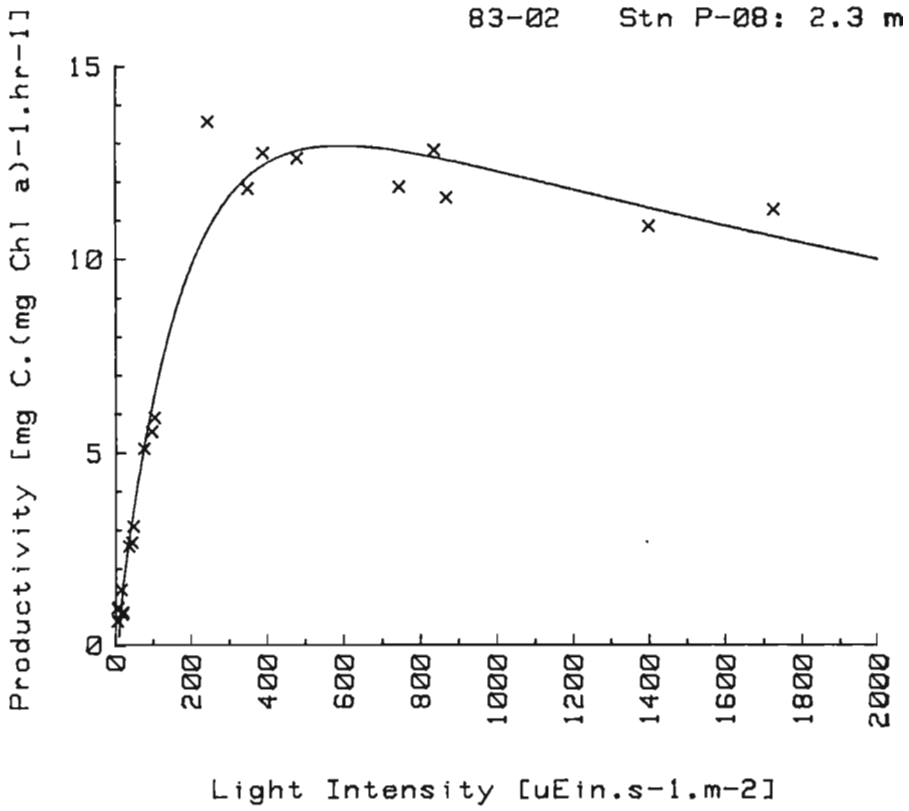
```
Cruise : 83-02        Date:  83.05.19              Depth:  2.3       m
Station: P-08         Time:  0633 (LAT)    Chlorophyll a:  1.42      mg.m-3
                             0740 (PDT)    Dis. Inorg. C:  1.64E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   15.189   +/-   2.428
              Alpha =     .085   +/-    .013
              Beta  =     .0032  +/-    .0027


          Derived parameters:
                 Pm =   12.93
                 Im =  590.6
                 Is =  177.8
                 Ib =    4.75E+03


                 n =   21
                 r =     .985 with 17 degrees of freedom
```


83-02 Stn P-07: 0 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
9
10
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]


83-02 Stn P-08: 2.3 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
5
10
15
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-02        Date:  83.05.19              Depth:  3.0      m
Station: P-09         Time:  0923 (LAT)    Chlorophyll a:  2.07     mg.m-3
                             1040 (PDT)    Dis. Inorg. C:  1.61E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   12.085   +/-   1.144
              Alpha =     .065   +/-    .006
              Beta  =     .0010  +/-    .0011


          Derived parameters:
                 Pm =   11.17
                 Im =  776.9
                 Is =  185.0
                 Ib =    1.21E+04

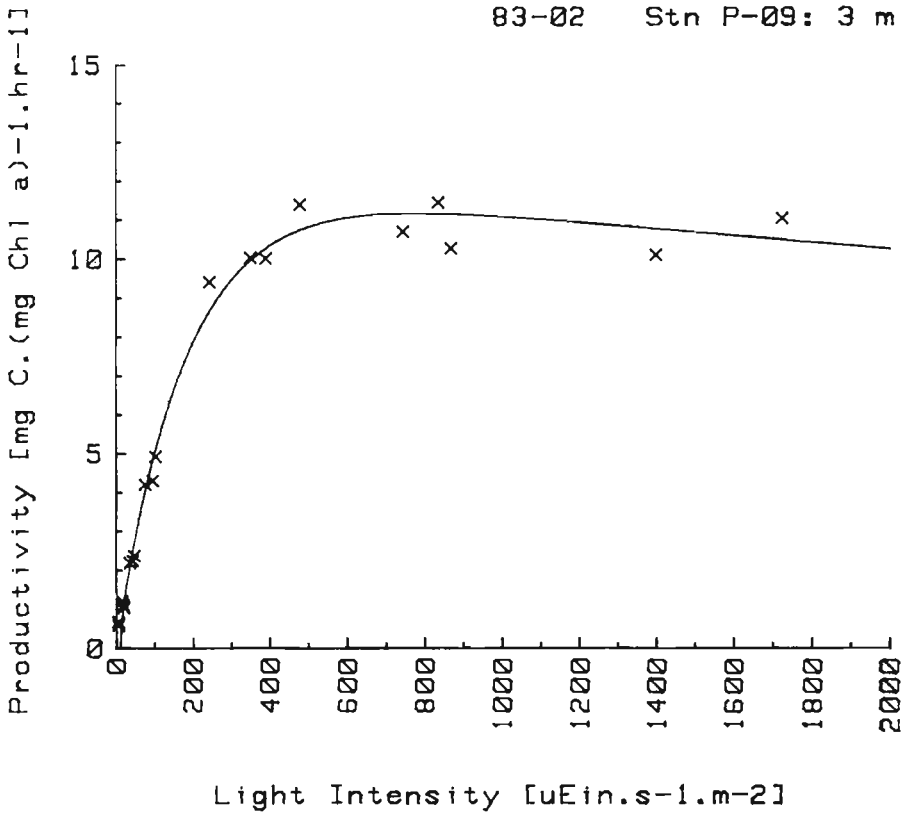

                 n =   21
                 r =     .995 with 17 degrees of freedom
```

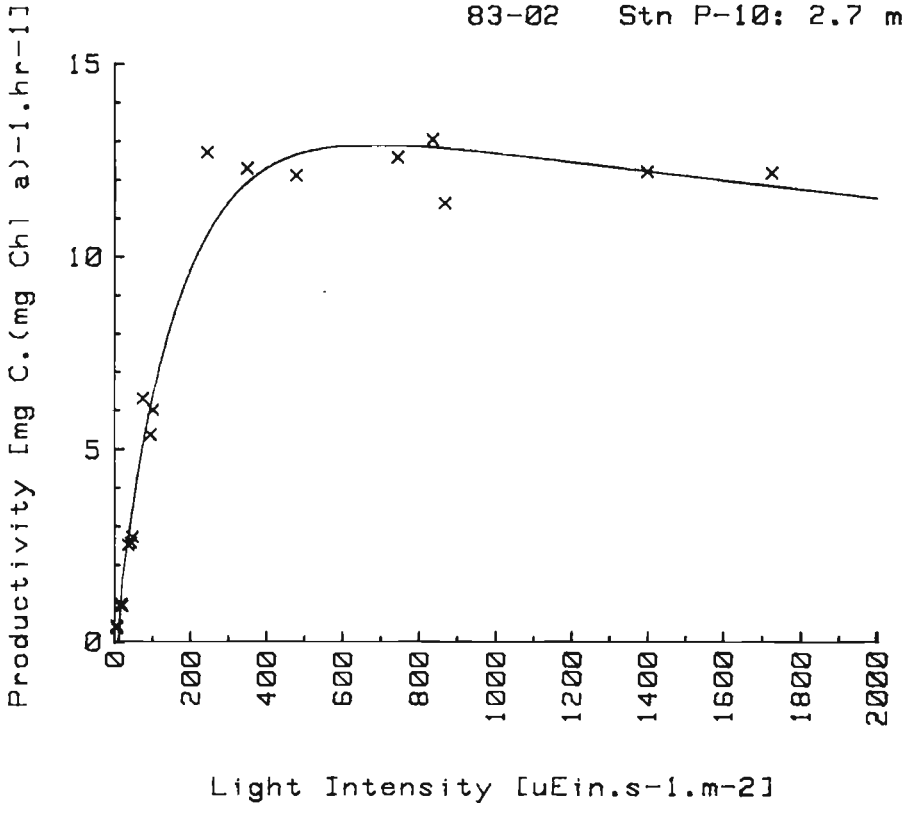
```
Cruise : 83-02        Date:  83.05.19              Depth:  2.7      m
Station: P-10         Time:  1231 (LAT)    Chlorophyll a:  1.54     mg.m-3
                             1348 (PDT)    Dis. Inorg. C:  1.72E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   14.039   +/-   2.026
              Alpha =     .085   +/-    .013
              Beta  =     .0014  +/-    .0020


          Derived parameters:
                 Pm =   12.90
                 Im =  679.7
                 Is =  164.9
                 Ib =    1.00E+04


                 n =   20
                 r =     .987 with 16 degrees of freedom
```


83-02 Stn P-09: 3 m
Productivity [mg C.(mg Chl a)-1.hr-1]
15
10
5
0
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]


83-02 Stn P-10: 2.7 m
Productivity [mg C.(mg Chl a)-1.hr-1]
15
10
5
0
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

Cruise : 83-02	Date:	83.05.20	Depth:	4.4	m
Station: P-11	Time:	0617 (LAT)	Chlorophyll a:	2.00	mg.m-3
		0735 (PDT)	Dis. Inorg. C:	1.69E+04	mg.m-3

Final estimates +/- 90% confidence limits:

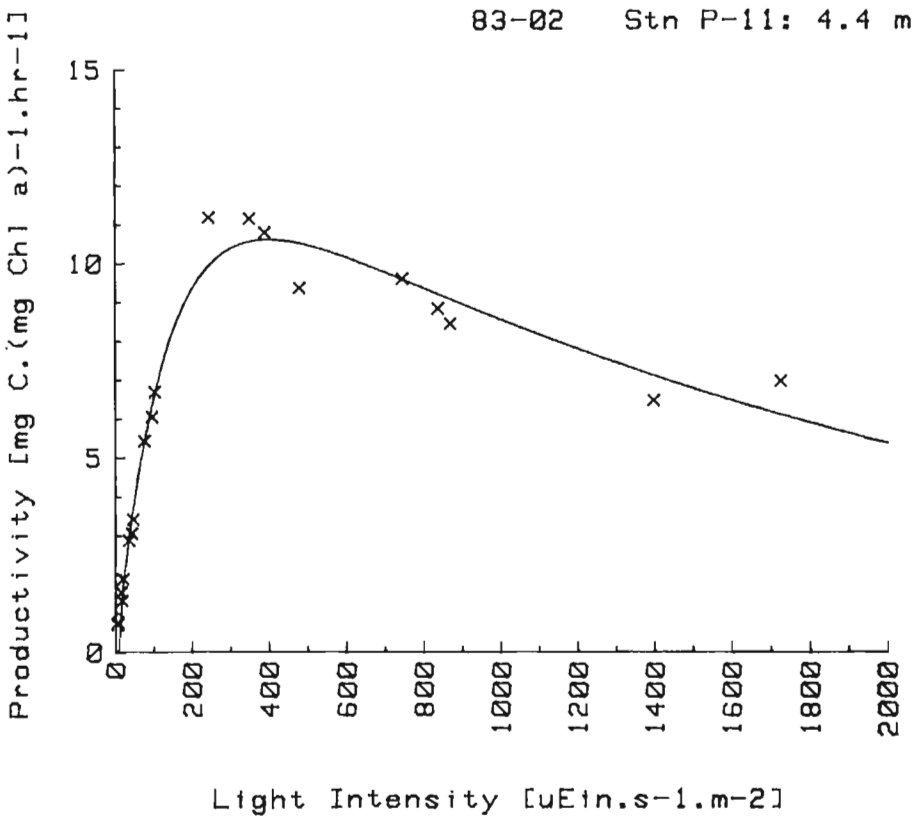
Psb	=	13.637	+/-	1.568
Alpha	=	.095	+/-	.010
Beta	=	.0064	+/-	.0024

Derived parameters:

Pm	=	10.62
Im	=	397.0
Is	=	143.4
Ib	=	2.14E+03

n = 21

r = .989 with 17 degrees of freedom


83-02 Stn P-11: 4.4 m
Productivity [mg C.(mg Chl a)-1.hr-1]
15
10
5
0
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

Cruise : 83-02	Date:	83.05.20	Depth:	5.3	m
Station: P-12	Time:	0831 (LAT)	Chlorophyll a:	1.51	mg.m-3
		0949 (PDT)	Dis. Inorg. C:	1.98E+04	mg.m-3

Final estimates +/- 90% confidence limits:

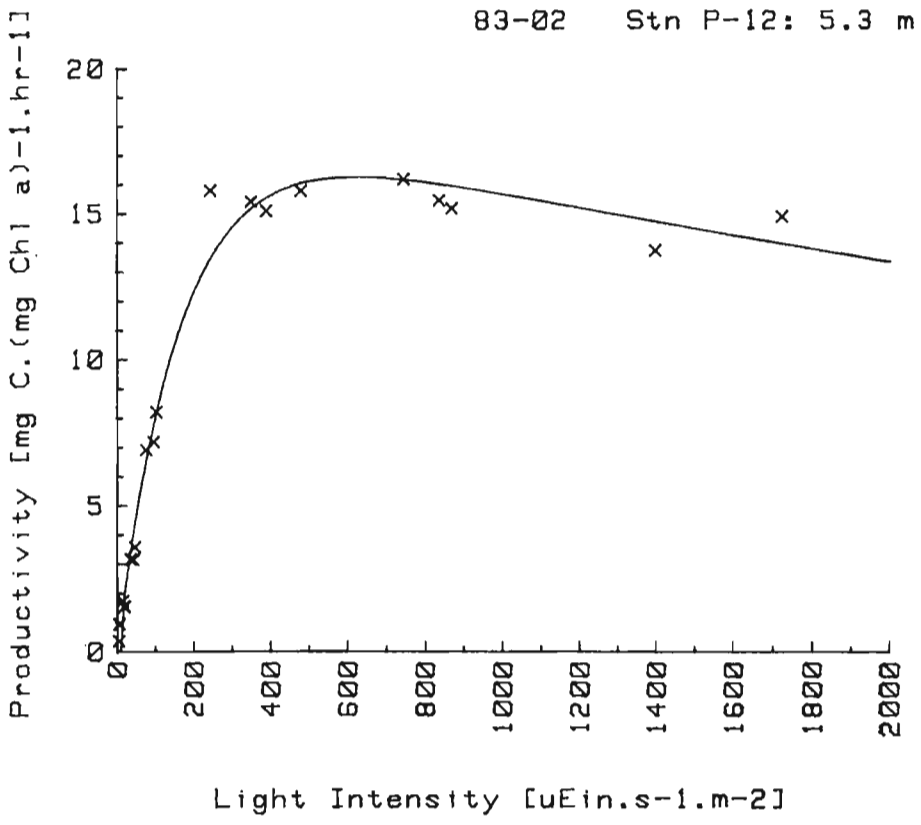
Psb	=	18.465	+/-	2.053
Alpha	=	.108	+/-	.012
Beta	=	.0030	+/-	.0022

Derived parameters:

Pm	=	16.25
Im	=	618.8
Is	=	171.5
Ib	=	6.15E+03

n = 21

r = .992 with 17 degrees of freedom


83-02 Stn P-12: 5.3 m
Productivity [mg C.(mg Chl a)-1.hr-1]
20
15
10
5
0
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-02        Date:  83.05.23              Depth: 15.0       m
Station: P-15         Time:  0846 (LAT)    Chlorophyll a:  4.84      mg.m-3
                             1003 (PDT)    Dis. Inorg. C:  2.25E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    8.574   +/-   7.529
              Alpha =     .027   +/-    .004
              Beta  =     .0074  +/-    .0117


          Derived parameters:
                 Pm =    4.39
                 Im =  489.4
                 Is =  320.6
                 Ib =    1.15E+03

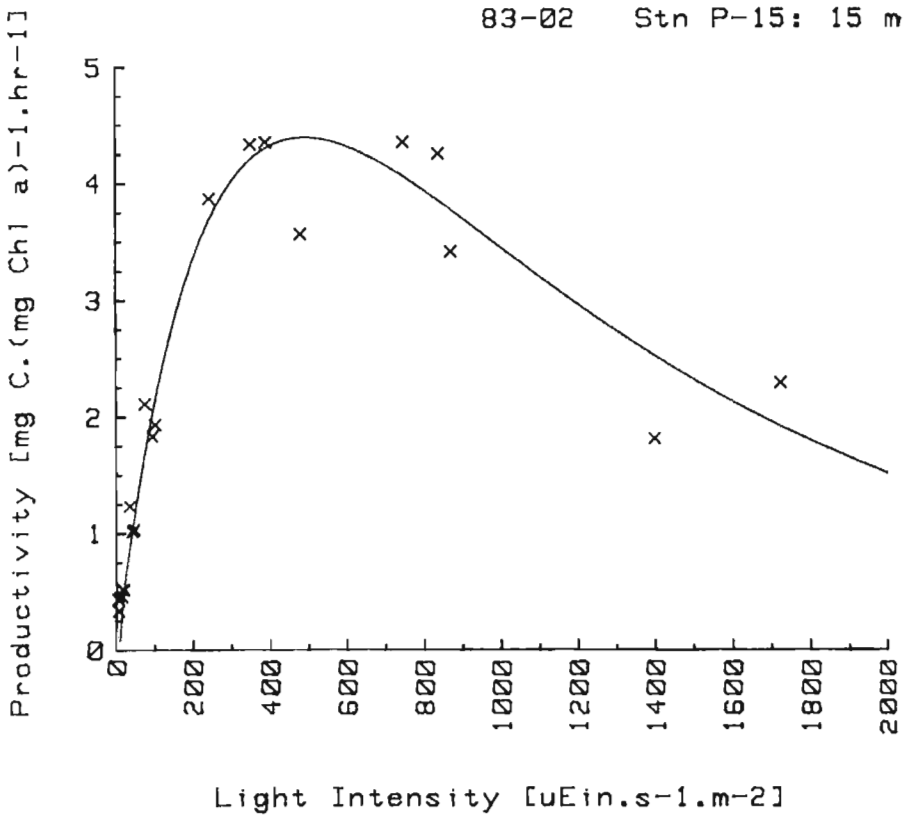

                 n =   20
                 r =     .974 with 16 degrees of freedom
```

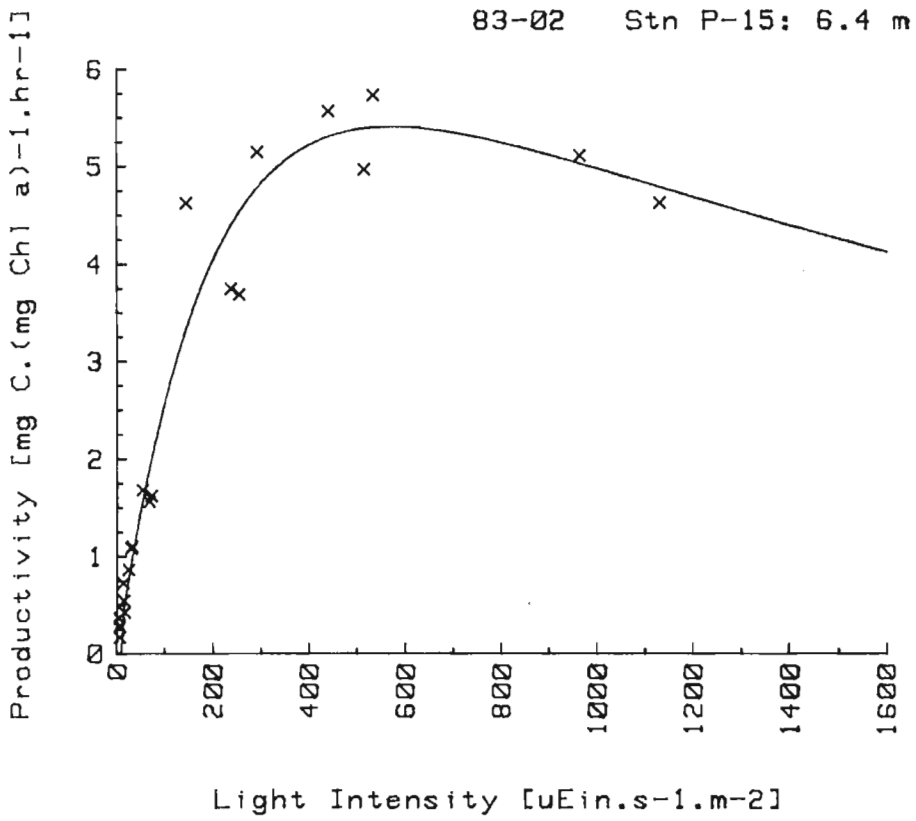
```
Cruise : 83-02        Date:  83.05.23              Depth:  6.4       m
Station: P-15         Time:  0847 (LAT)    Chlorophyll a: 18.61      mg.m-3
                             1004 (PDT)    Dis. Inorg. C:  2.14E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    6.965   +/-   3.005
              Alpha =     .034   +/-    .007
              Beta  =     .0023  +/-    .0041


          Derived parameters:
                 Pm =    5.40
                 Im =  571.3
                 Is =  207.6
                 Ib =    3.04E+03


                 n =   21
                 r =     .976 with 17 degrees of freedom
```


83-02 Stn P-15: 15 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]


83-02 Stn P-15: 6.4 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-02        Date:  83.05.23              Depth: 14.3       m
Station: P-16         Time:  1140 (LAT)    Chlorophyll a: 17.43      mg.m-3
                             1257 (PDT)    Dis. Inorg. C:  2.20E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    5.145   +/-   1.112
              Alpha =     .053   +/-    .013
              Beta  =     .0002  +/-    .0016


          Derived parameters:
                 Pm =    5.00
                 Im =  524.5
                 Is =   96.9
                 Ib =    2.17E+04

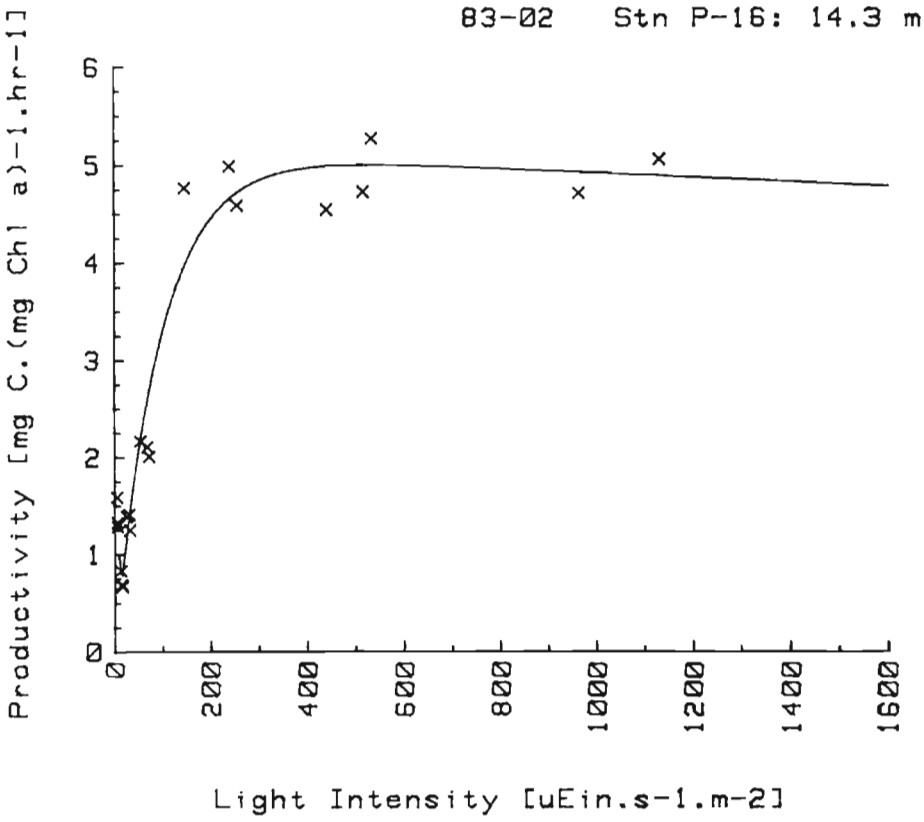

                 n =   20
                 r =     .949 with 16 degrees of freedom
```

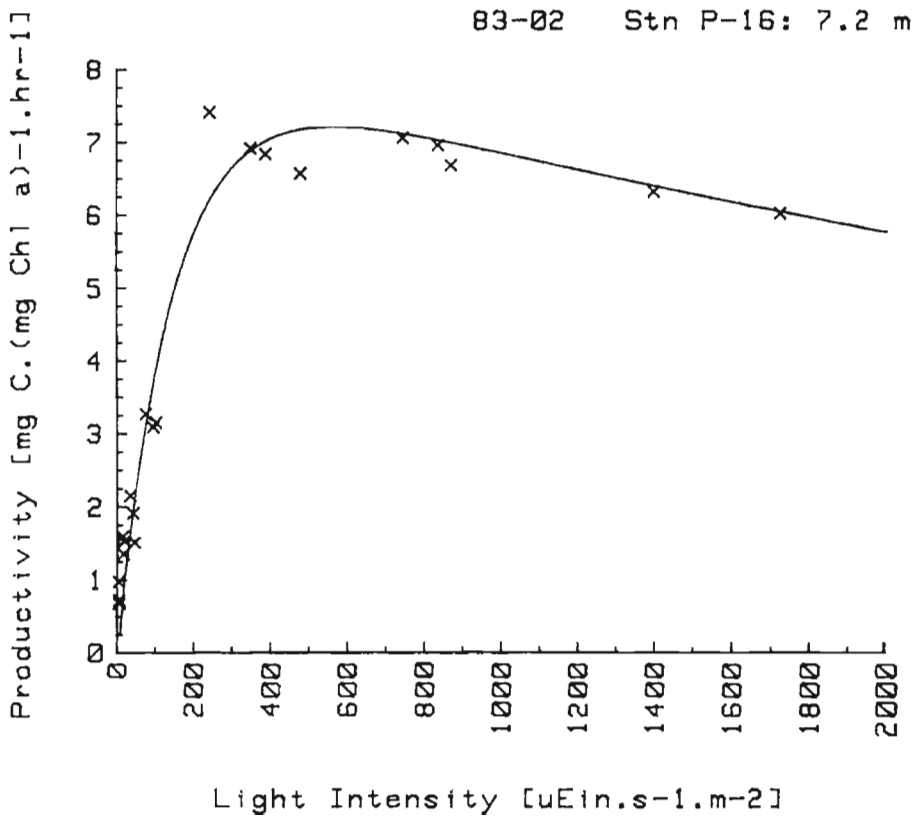
```
Cruise : 83-02        Date:  83.05.23              Depth:  7.2       m
Station: P-16         Time:  1141 (LAT)    Chlorophyll a: 21.07      mg.m-3
                             1258 (PDT)    Dis. Inorg. C:  2.14E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    8.164   +/-   1.193
              Alpha =     .053   +/-    .008
              Beta  =     .0014  +/-    .0013


          Derived parameters:
                 Pm =    7.21
                 Im =  561.8
                 Is =  154.3
                 Ib =    5.73E+03


                 n =   21
                 r =     .980 with 17 degrees of freedom
```


83-02 Stn P-16: 14.3 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]


83-02 Stn P-16: 7.2 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-02        Date:  83.05.23              Depth: 13.6       m
Station: P-17         Time:  1441 (LAT)    Chlorophyll a: 20.12      mg.m-3
                             1548 (PDT)    Dis. Inorg. C:  2.19E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    4.075   +/-    .761
              Alpha =     .066   +/-    .019
              Beta  =     .0000  +/-    .0012


          Derived parameters:
                 Pm =    4.07
                 Im =  546.1
                 Is =   62.1
                 Ib =    4.07E+05

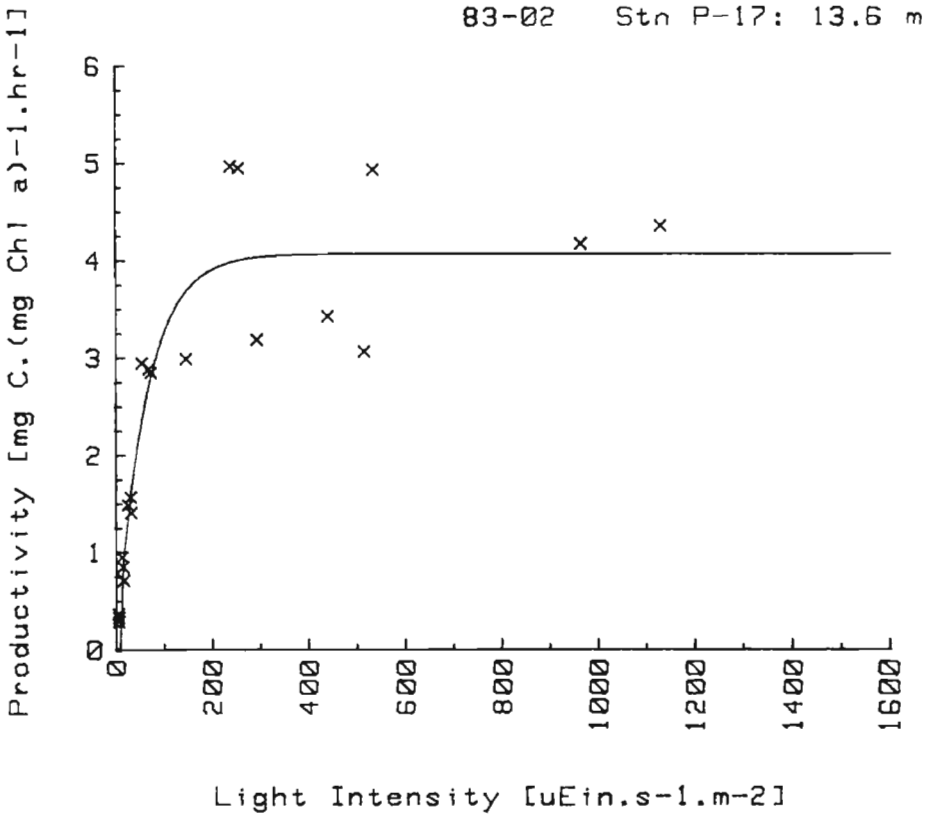

                 n =   21
                 r =     .935 with 17 degrees of freedom
```

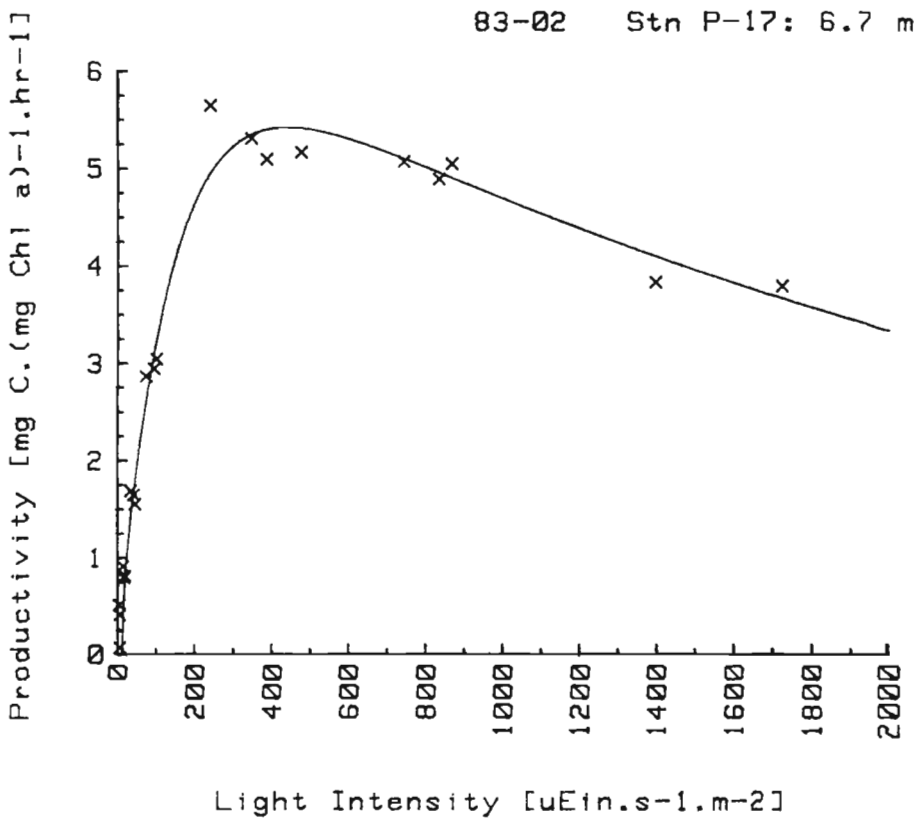
```
Cruise : 83-02        Date:  83.05.23              Depth:  6.7       m
Station: P-17         Time:  1441 (LAT)    Chlorophyll a:  9.98      mg.m-3
                             1548 (PDT)    Dis. Inorg. C:  2.08E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    6.621   +/-    .644
              Alpha =     .046   +/-    .004
              Beta  =     .0023  +/-    .0009


          Derived parameters:
                 Pm =    5.42
                 Im =  441.6
                 Is =  144.8
                 Ib =    2.91E+03


                 n =   21
                 r =     .991 with 17 degrees of freedom
```


83-02 Stn P-17: 13.6 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]


83-02 Stn P-17: 6.7 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-02        Date:  83.05.24              Depth: 14.2       m
Station: P-18         Time:  0839 (LAT)    Chlorophyll a:  5.20      mg.m-3
                             0956 (PDT)    Dis. Inorg. C:  2.28E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    9.006   +/-   1.316
              Alpha =     .070   +/-    .009
              Beta  =     .0027  +/-    .0021


          Derived parameters:
                 Pm =    7.62
                 Im =  422.6
                 Is =  129.0
                 Ib =    3.29E+03

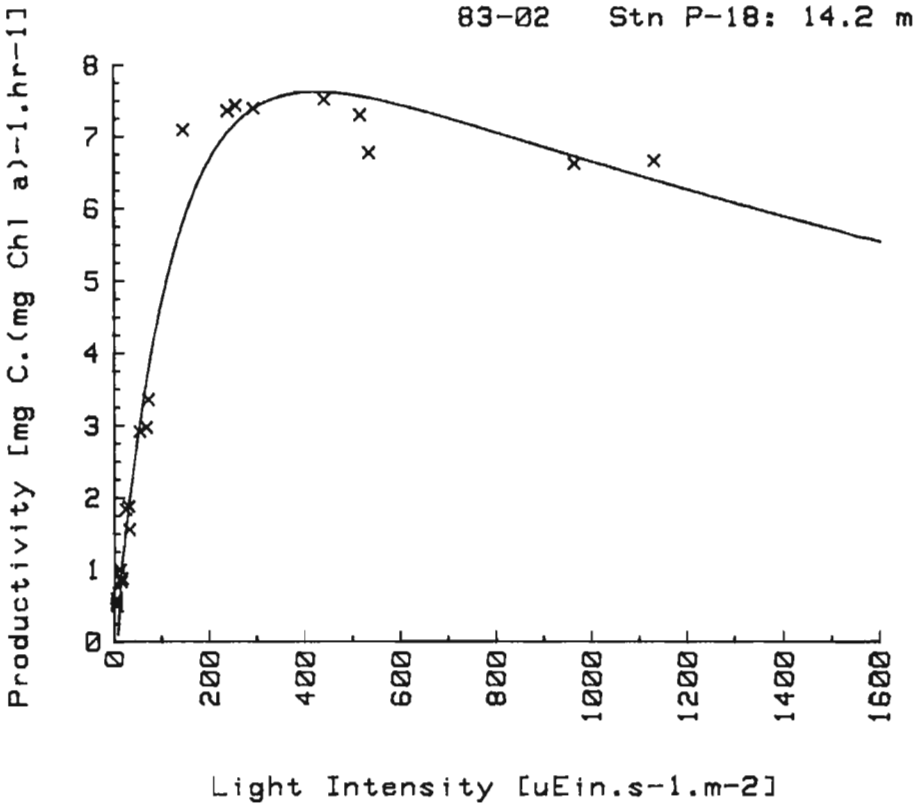

                 n =   21
                 r =     .988 with 17 degrees of freedom
```

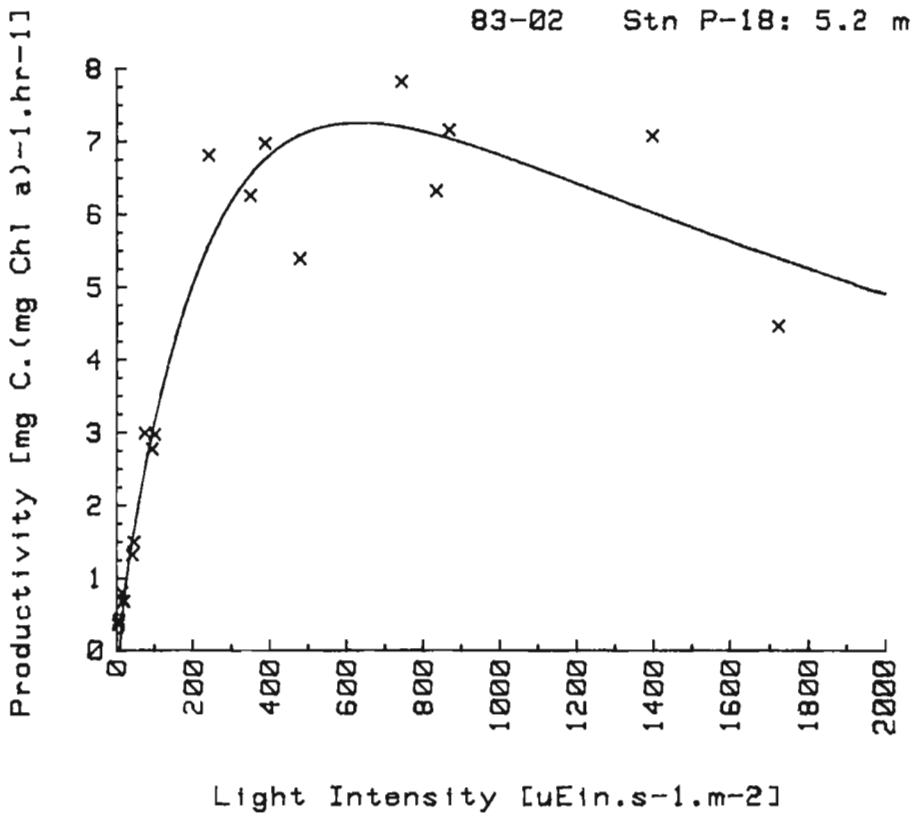
```
Cruise : 83-02        Date:  83.05.24              Depth:  5.2       m
Station: P-18         Time:  0839 (LAT)    Chlorophyll a: 21.61      mg.m-3
                             0956 (PDT)    Dis. Inorg. C:  2.15E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    9.840   +/-   3.692
              Alpha =     .039   +/-    .008
              Beta  =     .0034  +/-    .0042


          Derived parameters:
                 Pm =    7.26
                 Im =  633.7
                 Is =  251.5
                 Ib =    2.87E+03


                 n =   20
                 r =     .970 with 16 degrees of freedom
```


83-02 Stn P-18: 14.2 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]


83-02 Stn P-18: 5.2 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-02        Date:  83.05.24              Depth: 14.2       m
Station: P-19         Time:  1121 (LAT)    Chlorophyll a: 16.34      mg.m-3
                             1238 (PDT)    Dis. Inorg. C:  2.19E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    3.293   +/-    .791
              Alpha =     .034   +/-    .009
              Beta  =     .0009  +/-    .0014


          Derived parameters:
                 Pm =    2.90
                 Im =  353.6
                 Is =   98.1
                 Ib =    3.51E+03

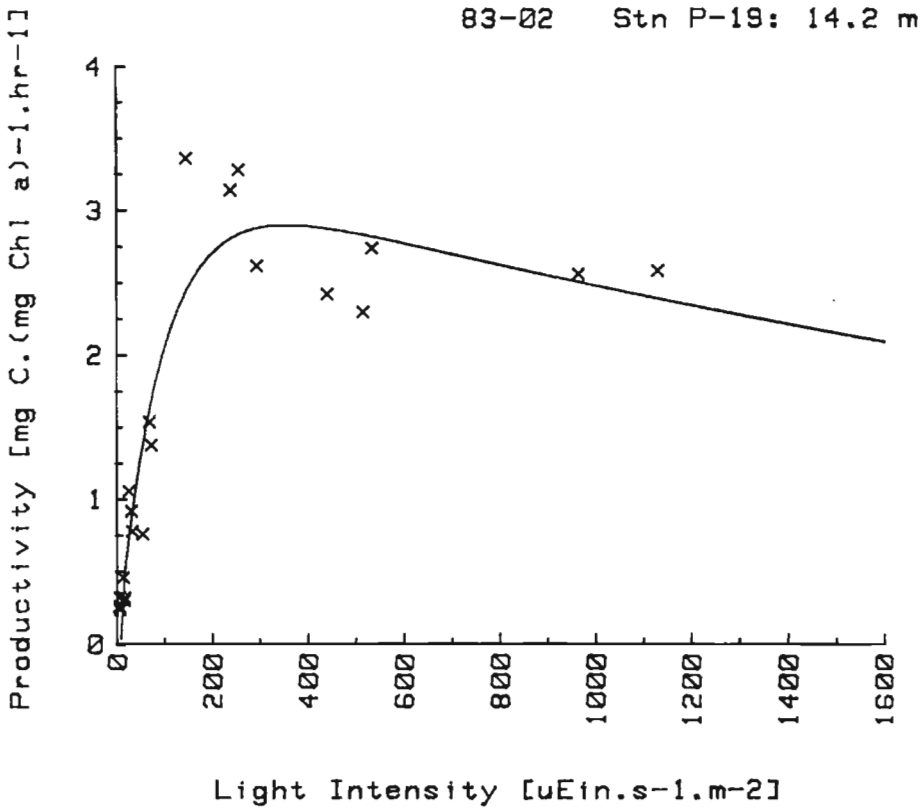

                 n =   21
                 r =     .945 with 17 degrees of freedom
```

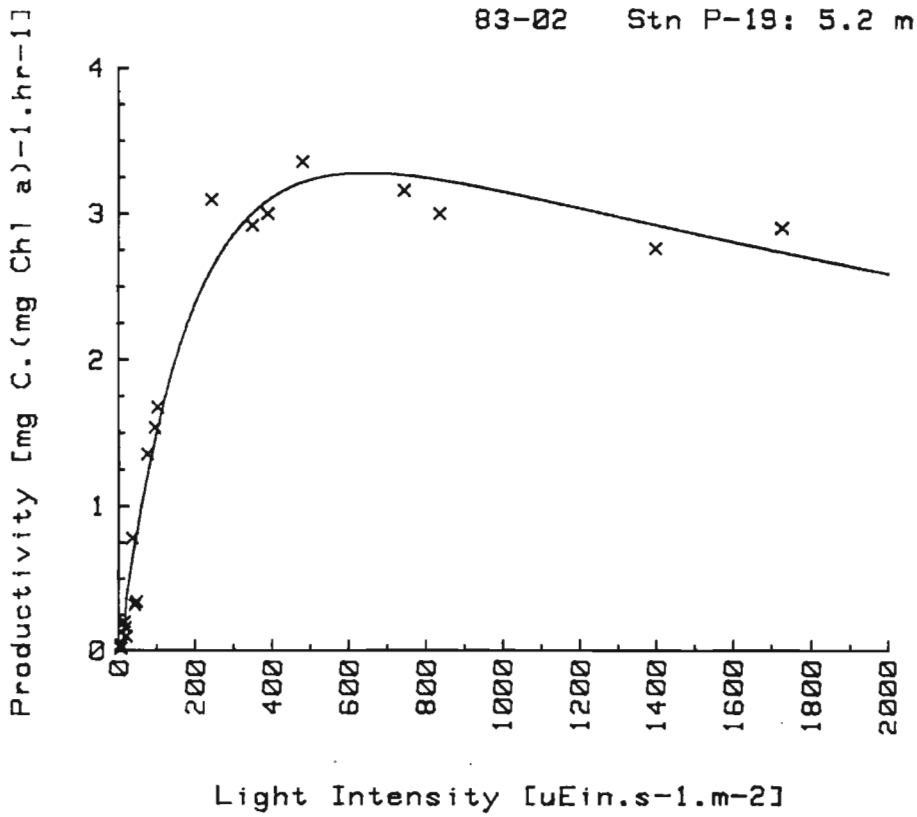
```
Cruise : 83-02        Date:  83.05.24              Depth:  5.2       m
Station: P-19         Time:  1122 (LAT)    Chlorophyll a:  2.29      mg.m-3
                             1239 (PDT)    Dis. Inorg. C:  2.07E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    3.889   +/-    .823
              Alpha =     .020   +/-    .004
              Beta  =     .0008  +/-    .0009


          Derived parameters:
                 Pm =    3.28
                 Im =  641.9
                 Is =  197.8
                 Ib =    4.88E+03


                 n =   20
                 r =     .982 with 16 degrees of freedom
```


83-02 Stn P-19: 14.2 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]


83-02 Stn P-19: 5.2 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-02        Date:  83.05.24              Depth: 14.4       m
Station: P-20         Time:  1418 (LAT)    Chlorophyll a: 11.44      mg.m-3
                             1535 (PDT)    Dis. Inorg. C:  2.12E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    6.565   +/-    .720
              Alpha =     .061   +/-    .007
              Beta  =     .0009  +/-    .0011


          Derived parameters:
                 Pm =    6.07
                 Im =  450.9
                 Is =  107.2
                 Ib =    7.08E+03

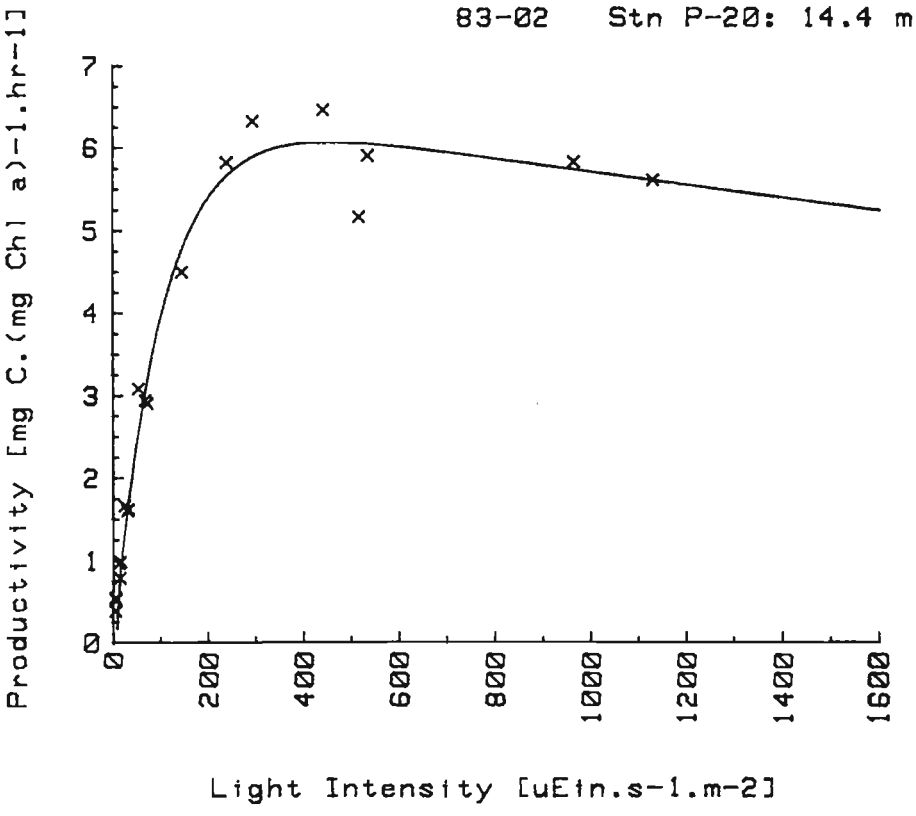

                 n =   20
                 r =     .990 with 16 degrees of freedom
```

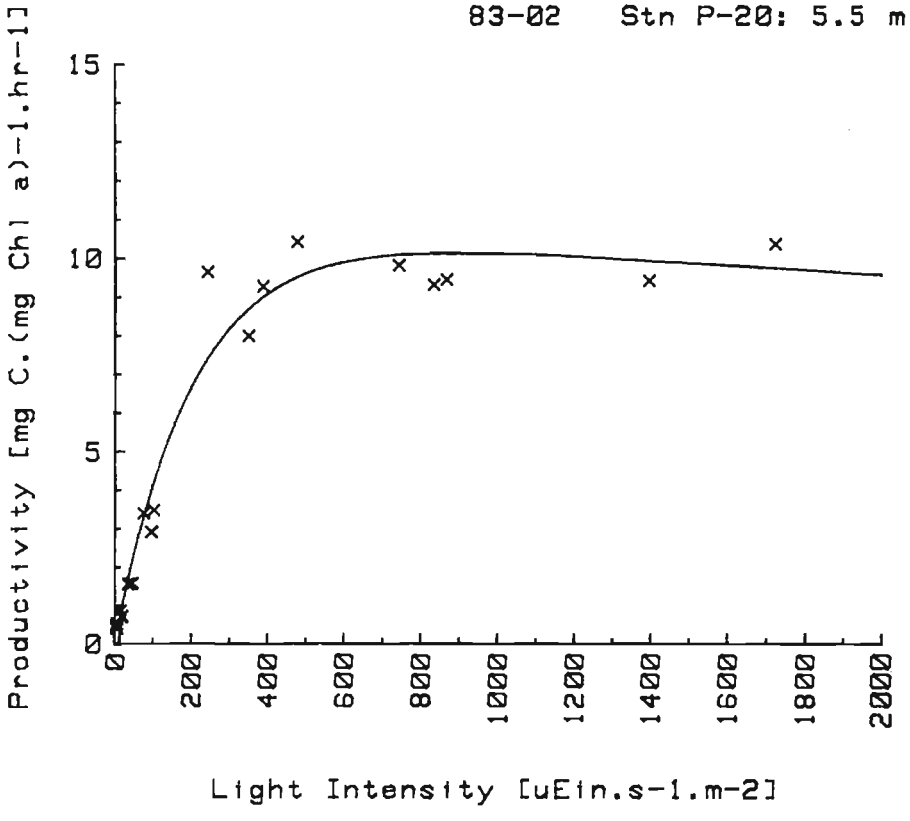
```
Cruise : 83-02        Date:  83.05.24              Depth:  5.5       m
Station: P-20         Time:  1419 (LAT)    Chlorophyll a: 19.41      mg.m-3
                             1536 (PDT)    Dis. Inorg. C:  2.13E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   10.886   +/-   2.229
              Alpha =     .053   +/-    .010
              Beta  =     .0007  +/-    .0020


          Derived parameters:
                 Pm =   10.14
                 Im =  893.2
                 Is =  206.5
                 Ib =    1.54E+04


                 n =   21
                 r =     .982 with 17 degrees of freedom
```


83-02 Stn P-20: 14.4 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]


83-02 Stn P-20: 5.5 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
5
10
15
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-02        Date:  83.05.25              Depth:  4.1       m
Station: P-22         Time:  1721 (LAT)    Chlorophyll a: 19.30      mg.m-3
                             1838 (PDT)    Dis. Inorg. C:  2.06E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    7.032   +/-   1.165
              Alpha =     .039   +/-    .006
              Beta  =     .0008  +/-    .0011


          Derived parameters:
                 Pm =    6.35
                 Im =  694.4
                 Is =  178.8
                 Ib =    8.51E+03

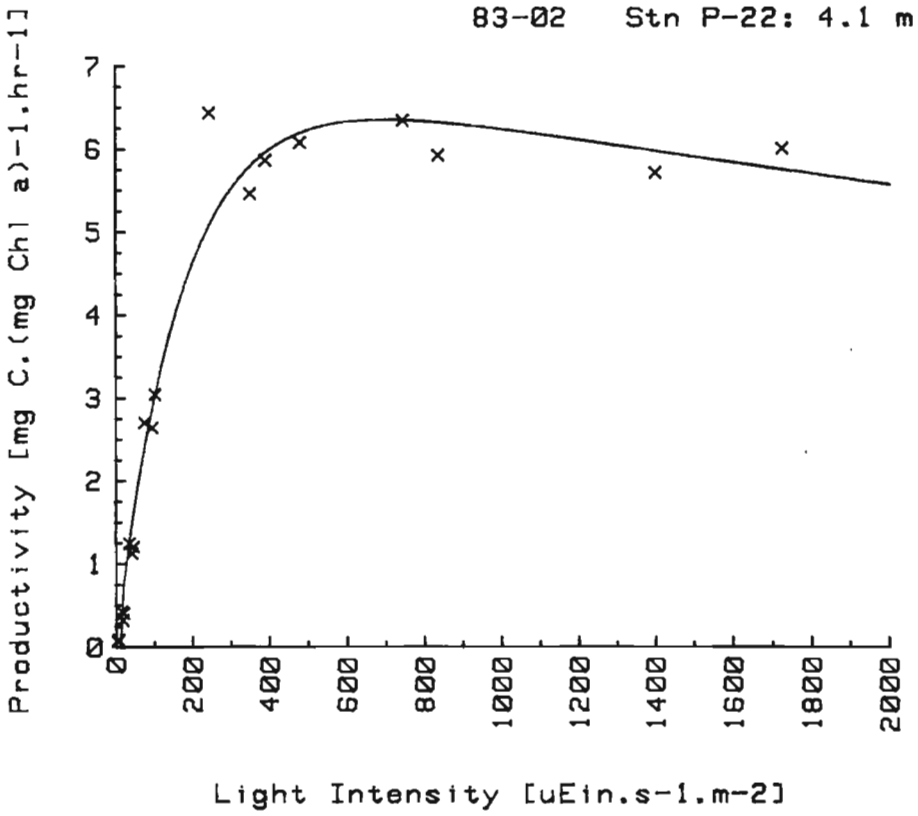

                 n =   20
                 r =     .985 with 16 degrees of freedom
```

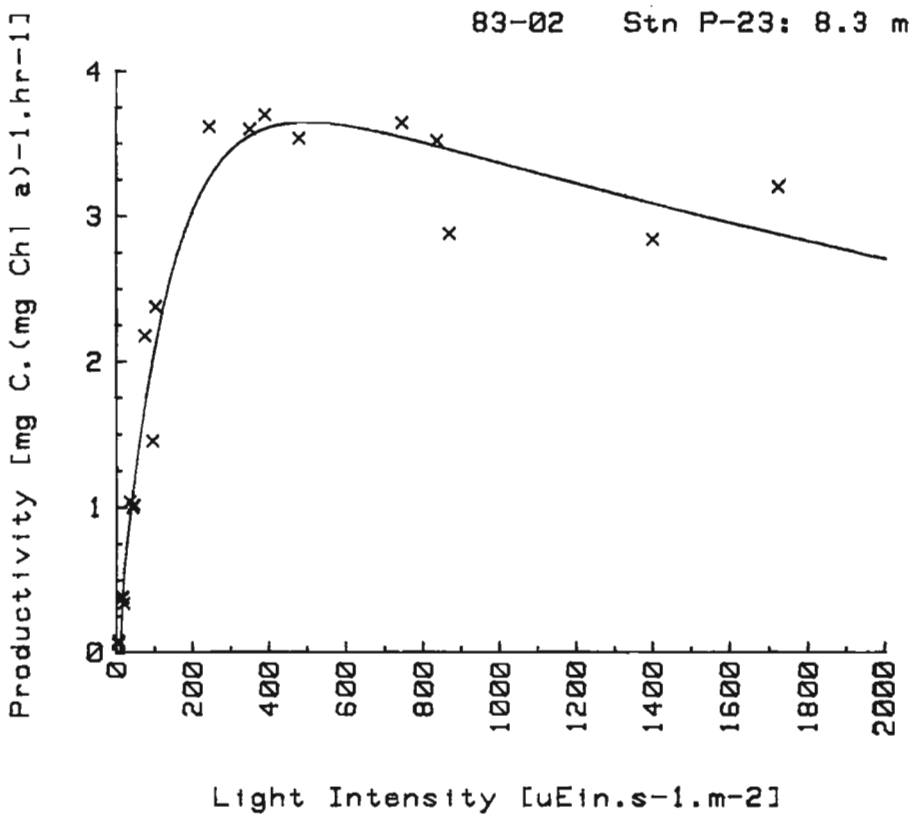
```
Cruise : 83-02        Date:  83.05.25              Depth:  8.3       m
Station: P-23         Time:  2020 (LAT)    Chlorophyll a: 27.07      mg.m-3
                             2137 (PDT)    Dis. Inorg. C:  2.18E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    4.188   +/-    .631
              Alpha =     .030   +/-    .005
              Beta  =     .0009  +/-    .0008


          Derived parameters:
                 Pm =    3.64
                 Im =  495.8
                 Is =  141.4
                 Ib =    4.57E+03


                 n =   21
                 r =     .979 with 17 degrees of freedom
```


83-02 Stn P-22: 4.1 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]


83-02 Stn P-23: 8.3 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-02        Date:  83.05.25              Depth:  7.2       m
Station: P-24         Time:  2320 (LAT)    Chlorophyll a: 25.67      mg.m-3
                             0037 (PDT)    Dis. Inorg. C:  2.18E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    4.697   +/-    .562
              Alpha =     .034   +/-    .005
              Beta  =     .0010  +/-    .0007


          Derived parameters:
                 Pm =    4.13
                 Im =  495.3
                 Is =  137.2
                 Ib =    4.93E+03

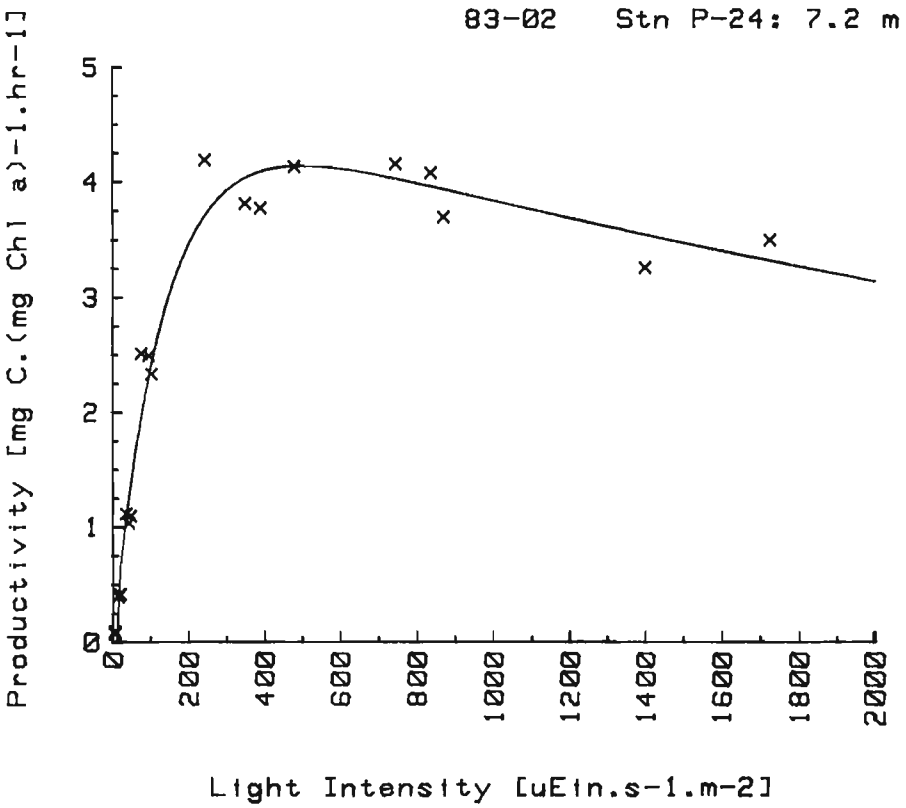

                 n =   21
                 r =     .986 with 17 degrees of freedom
```

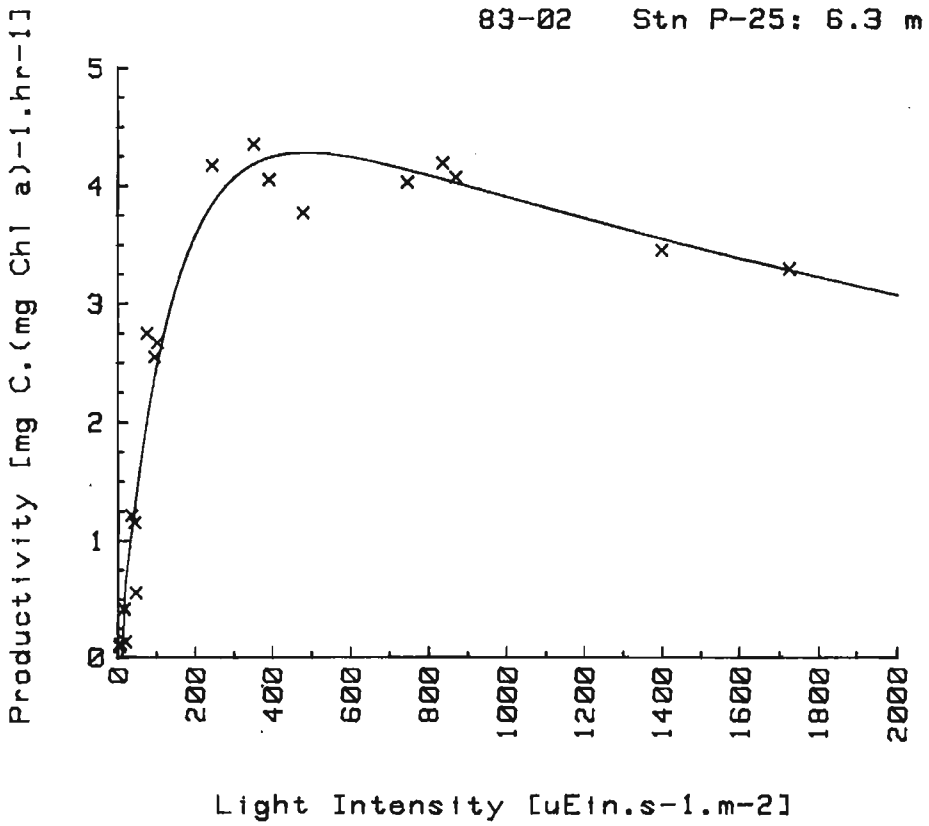
```
Cruise : 83-02        Date:  83.05.26              Depth:  6.3       m
Station: P-25         Time:  0227 (LAT)    Chlorophyll a: 24.52      mg.m-3
                             0341 (PDT)    Dis. Inorg. C:  2.18E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    4.976   +/-    .802
              Alpha =     .035   +/-    .006
              Beta  =     .0012  +/-    .0010


          Derived parameters:
                 Pm =    4.28
                 Im =  484.0
                 Is =  142.2
                 Ib =    4.14E+03


                 n =   21
                 r =     .977 with 17 degrees of freedom
```


83-02 Stn P-24: 7.2 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]


83-02 Stn P-25: 6.3 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-02        Date:  83.05.26              Depth:  6.4       m
Station: P-26         Time:  0531 (LAT)    Chlorophyll a: 24.68      mg.m-3
                             0645 (PDT)    Dis. Inorg. C:  2.12E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    5.200   +/-    .459
              Alpha =     .035   +/-    .003
              Beta  =     .0016  +/-    .0006


          Derived parameters:
                 Pm =    4.30
                 Im =  465.7
                 Is =  149.7
                 Ib =    3.21E+03

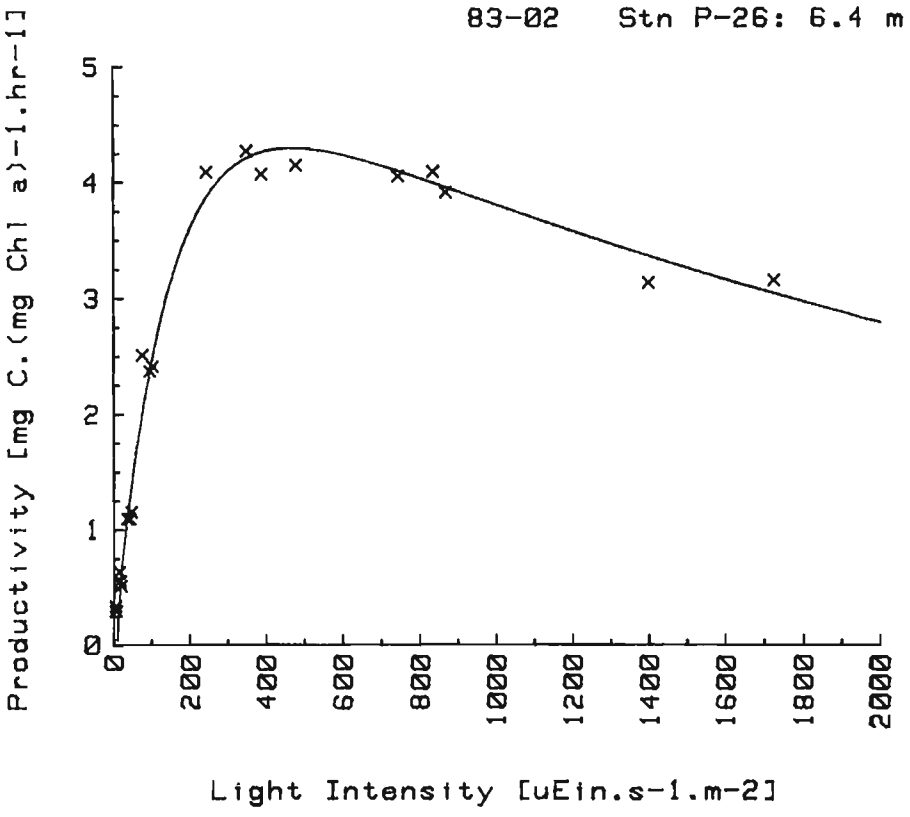

                 n =   21
                 r =     .993 with 17 degrees of freedom
```

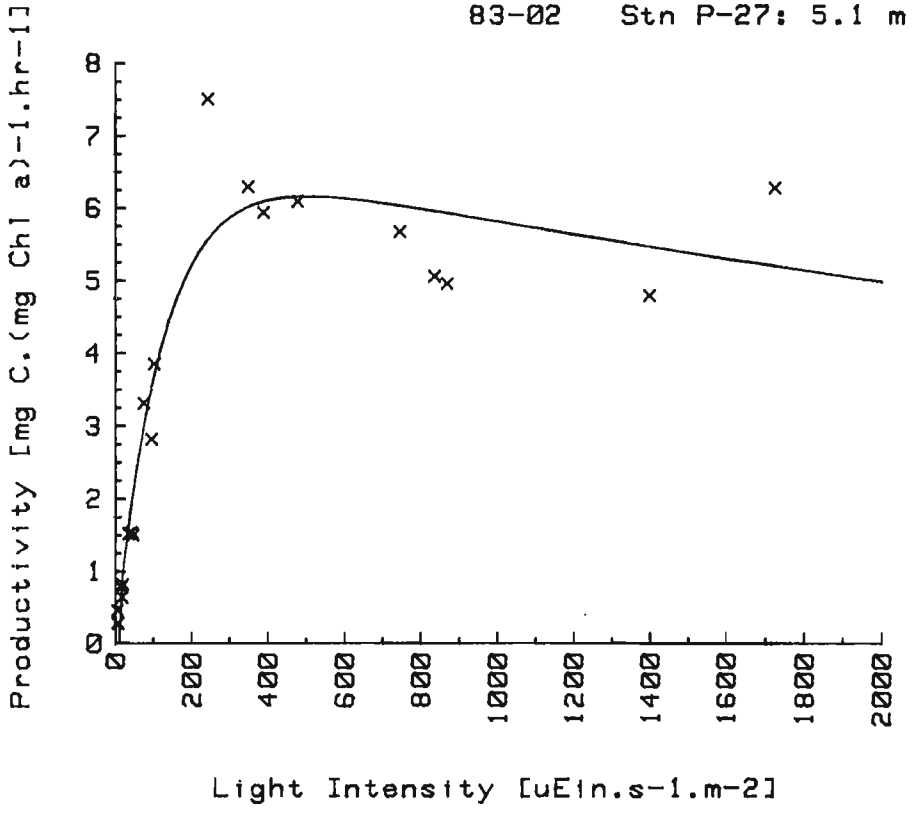
```
Cruise : 83-02        Date:  83.05.26              Depth:  5.1       m
Station: P-27         Time:  0822 (LAT)    Chlorophyll a: 21.99      mg.m-3
                             0939 (PDT)    Dis. Inorg. C:  2.18E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    6.788   +/-   1.279
              Alpha =     .053   +/-    .012
              Beta  =     .0011  +/-    .0015


          Derived parameters:
                 Pm =    6.16
                 Im =  502.2
                 Is =  127.3
                 Ib =    6.44E+03


                 n =   21
                 r =     .962 with 17 degrees of freedom
```


83-02 Stn P-26: 6.4 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]


83-02 Stn P-27: 5.1 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-02        Date:  83.05.26              Depth: 10.1       m
Station: P-28         Time:  1121 (LAT)    Chlorophyll a: 19.27      mg.m-3
                             1238 (PDT)    Dis. Inorg. C:  2.17E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   10.476   +/-   1.447
              Alpha =     .067   +/-    .008
              Beta  =     .0045  +/-    .0021


          Derived parameters:
                 Pm =    8.17
                 Im =  431.2
                 Is =  155.3
                 Ib =    2.34E+03

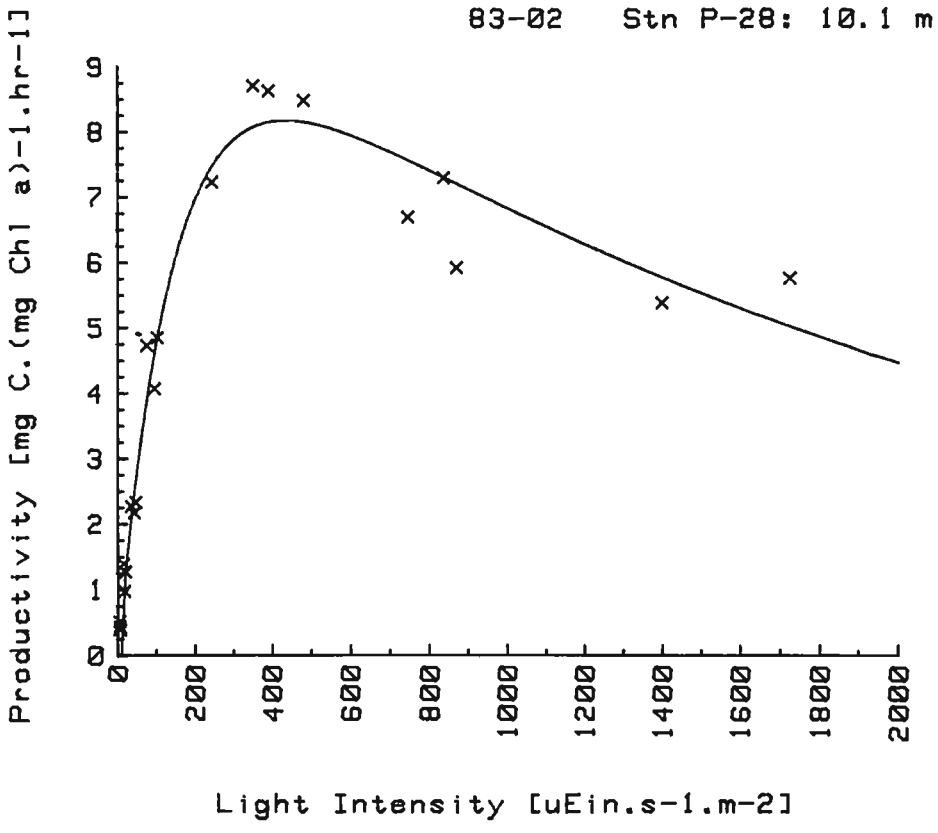

                 n =   21
                 r =     .986 with 17 degrees of freedom
```

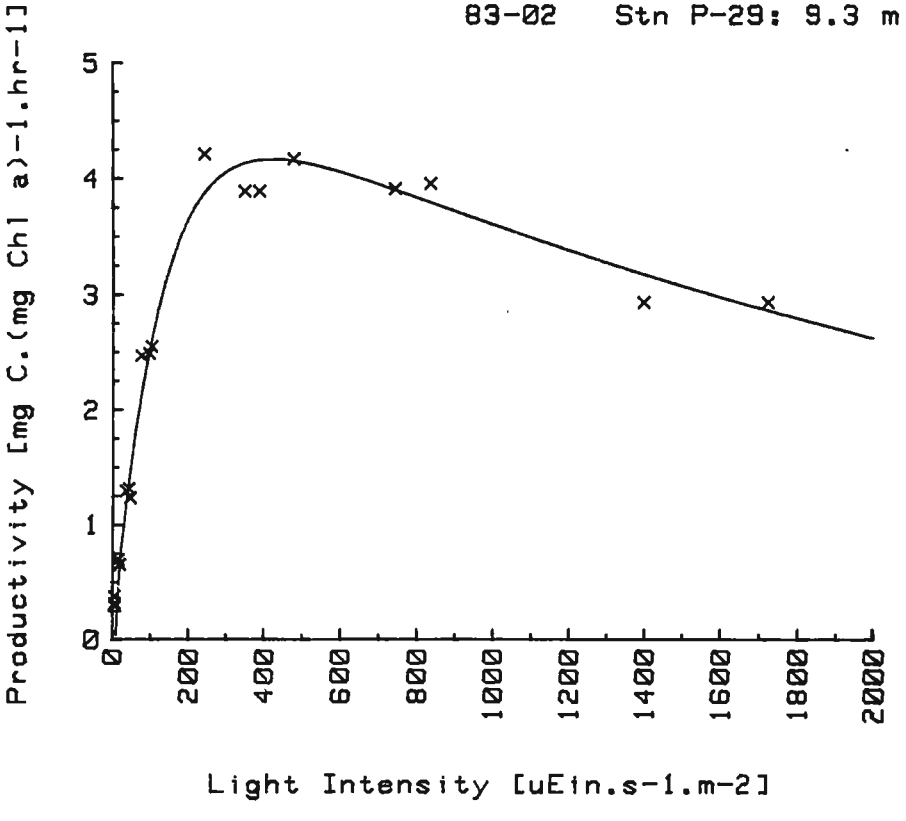
```
Cruise : 83-02        Date:  83.05.26              Depth:  9.3       m
Station: P-29         Time:  1424 (LAT)    Chlorophyll a: 20.43      mg.m-3
                             1541 (PDT)    Dis. Inorg. C:  2.19E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    4.960   +/-    .406
              Alpha =     .038   +/-    .003
              Beta  =     .0016  +/-    .0005


          Derived parameters:
                 Pm =    4.17
                 Im =  419.7
                 Is =  130.2
                 Ib =    3.14E+03


                 n =   20
                 r =     .992 with 16 degrees of freedom
```


83-02 Stn P-28: 10.1 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
9
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]


83-02 Stn P-29: 9.3 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-02        Date:  83.05.26              Depth:  8.0       m
Station: P-30         Time:  1747 (LAT)    Chlorophyll a:  8.71      mg.m-3
                             1901 (PDT)    Dis. Inorg. C:  2.16E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    1.167   +/-    .127
              Alpha =     .016   +/-    .003
              Beta  =     .0001  +/-    .0002


          Derived parameters:
                 Pm =    1.11
                 Im =  356.2
                 Is =   73.6
                 Ib =    9.22E+03

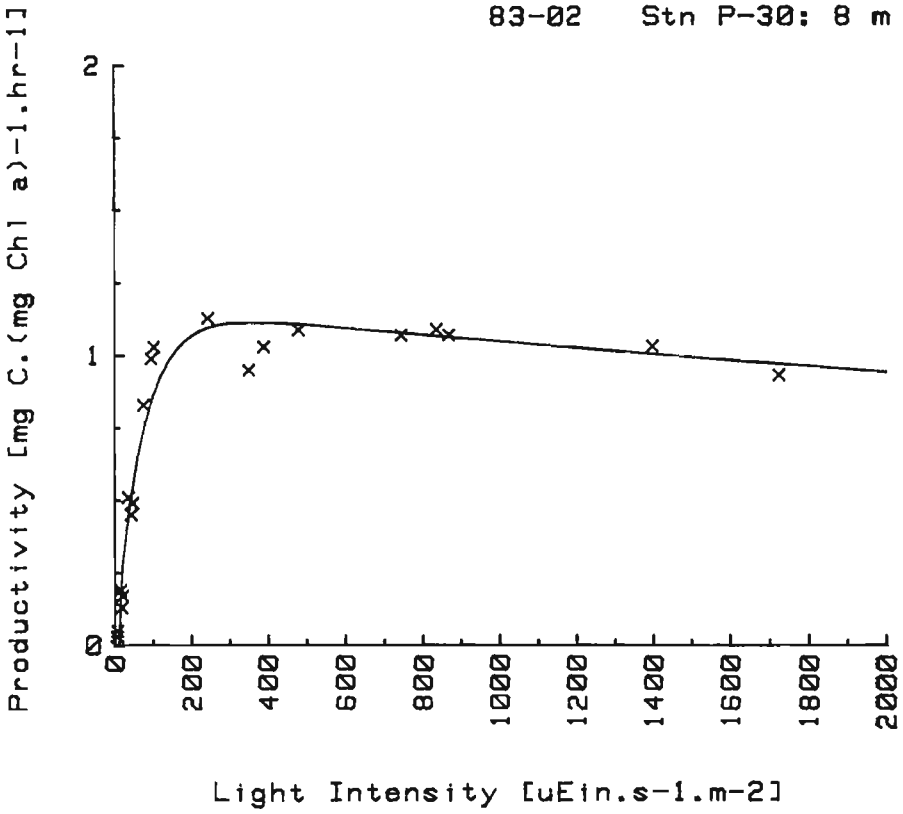

                 n =   21
                 r =     .974 with 17 degrees of freedom
```

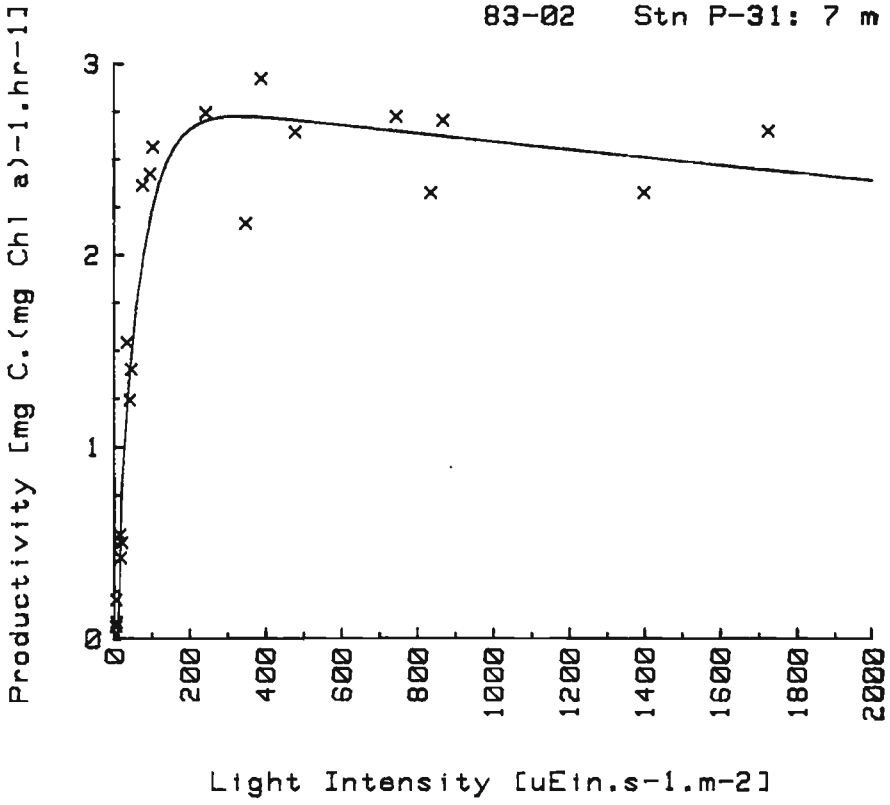
```
Cruise : 83-02        Date:  83.05.26              Depth:  7.0       m
Station: P-31         Time:  2212 (LAT)    Chlorophyll a:  6.93      mg.m-3
                             2329 (PDT)    Dis. Inorg. C:  2.14E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    2.814   +/-    .342
              Alpha =     .045   +/-    .009
              Beta  =     .0002  +/-    .0004


          Derived parameters:
                 Pm =    2.72
                 Im =  330.2
                 Is =   62.7
                 Ib =    1.21E+04


                 n =   21
                 r =     .963 with 17 degrees of freedom
```


83-02 Stn P-30: 8 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]


83-02 Stn P-31: 7 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-02        Date:  83.05.27              Depth:  7.1       m
Station: P-32         Time:  0630 (LAT)    Chlorophyll a:  4.10      mg.m-3
                             0747 (PDT)    Dis. Inorg. C:  2.17E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    2.491   +/-    .239
              Alpha =     .025   +/-    .003
              Beta  =     .0005  +/-    .0003


          Derived parameters:
                 Pm =    2.24
                 Im =  390.3
                 Is =  101.6
                 Ib =    4.63E+03

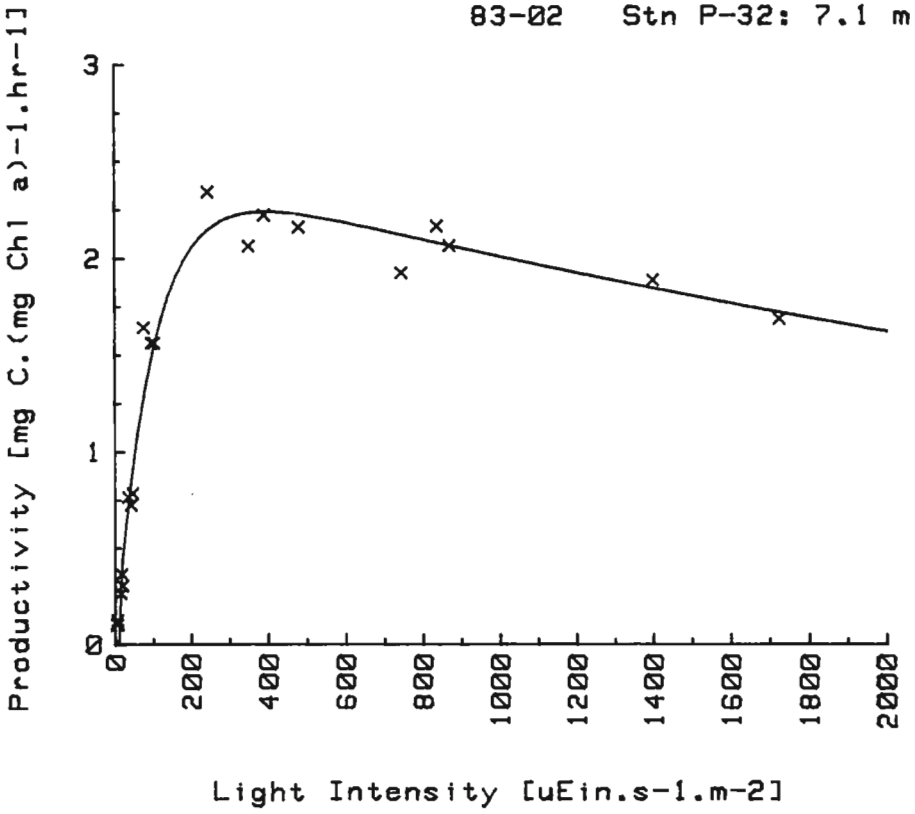

                 n =   21
                 r =     .985 with 17 degrees of freedom
```

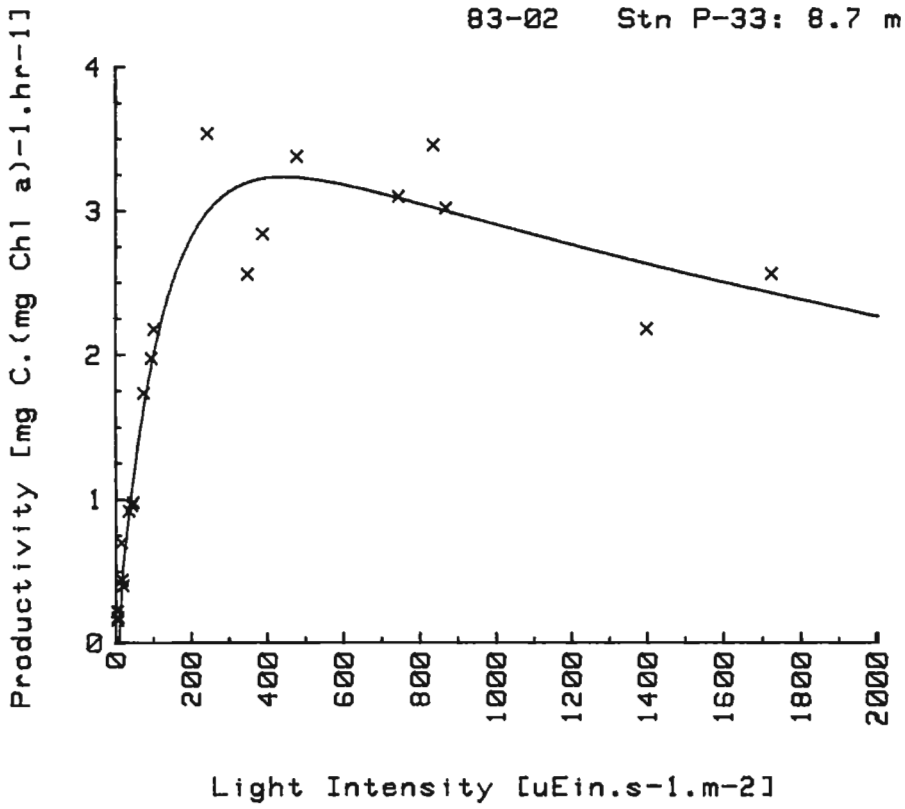
```
Cruise : 83-02        Date:  83.05.27              Depth:  8.7       m
Station: P-33         Time:  0934 (LAT)    Chlorophyll a:  3.24      mg.m-3
                             1048 (PDT)    Dis. Inorg. C:  2.17E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    3.724   +/-    .584
              Alpha =     .029   +/-    .005
              Beta  =     .0009  +/-    .0007


          Derived parameters:
                 Pm =    3.23
                 Im =  442.3
                 Is =  126.8
                 Ib =    4.02E+03


                 n =   21
                 r =     .971 with 17 degrees of freedom
```


83-02 Stn P-32: 7.1 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]


83-02 Stn P-33: 8.7 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

CRUISE 83-04

P(I) data
Station data
Fitted and derived parameters
Plots of data and fitted curves

Cruise : 83-04 Station : P-08
Depth : 0.0 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	926.4	13.78
2	1222.0	12.94
3	1250.2	13.58
4	579.4	12.00
5	621.0	10.30
6	230.8	8.14
7	262.3	5.14
8	285.6	9.90
9	73.1	4.24
10	82.4	2.44
11	37.0	.98
12	41.8	1.26
13	45.0	1.46
14	18.4	.56
15	22.6	.50
16	7.9	.14
17	9.0	.02
18	9.3	.14

Cruise : 83-04 Station : 20
Depth : 19.7 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	639.2	9.86
2	805.2	9.28
3	909.8	8.48
4	357.0	8.76
5	453.3	8.80
6	498.1	9.08
7	169.4	8.54
8	215.8	8.10
9	240.7	7.06
10	56.9	3.42
11	66.9	3.02
12	76.9	3.06
13	29.6	1.60
14	34.5	1.40
15	38.2	1.32
16	14.9	.60
17	17.1	.66
18	18.8	.64
19	6.3	.20
20	7.8	.24
21	8.0	.22

Cruise : 83-04 Station : 20
Depth : 5.6 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	926.4	11.74
2	1222.0	11.40
3	1250.2	10.86
4	481.5	11.68
5	579.4	11.72
6	621.0	11.24
7	230.8	10.24
8	262.3	10.06
9	285.6	9.76
10	73.1	3.22
11	82.4	3.04
12	90.7	3.24
13	37.0	1.18
14	41.8	1.04
15	45.0	1.18
16	18.4	.20
17	19.9	.28
18	22.6	.30
19	7.9	.06
20	9.0	.06
21	9.3	.02

Cruise : 83-04 Station : 22
Depth : 52.9 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	926.4	1.96
2	1222.0	1.40
3	73.1	2.92
4	82.4	2.58
5	7.9	.38
6	9.0	.36

Cruise : 83-04 Station : 25
Depth : 30.0 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	926.4	2.72
2	1222.0	2.28
3	73.1	4.06
4	82.4	3.44
5	7.9	.42
6	9.0	.32

Cruise : 83-04 Station : 34
Depth : 3.7 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	926.4	8.08
2	1222.0	7.54
3	1250.2	6.76
4	481.5	6.64
5	579.4	7.24
6	621.0	5.72
7	230.8	5.74
8	262.3	4.76
9	73.1	2.78
10	82.4	2.42
11	90.7	2.38
12	37.0	1.04
13	41.8	.90
14	45.0	.98
15	18.4	.58
16	19.9	.20
17	22.6	.20
18	9.0	.04
19	9.3	.06

Cruise : 83-04 Station : 40
Depth : 19.3 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	926.4	2.56
2	1250.2	.10
3	621.0	2.96
4	230.8	5.86
5	285.6	5.60
6	73.1	2.98
7	90.7	2.70
8	37.0	1.14
9	45.0	3.80
10	18.4	1.12
11	7.9	.42
12	9.3	.32

Cruise : 83-04 Station : 43
Depth : 20.2 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	926.4	2.64
2	1222.0	2.68
3	481.5	3.04
4	230.8	2.98
5	262.3	3.18
6	73.1	2.24
7	37.0	1.44
8	41.8	1.74
9	18.4	.80
10	7.9	.20

Cruise : 83-04 Station : 50
Depth : 16.8 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	946.4	10.46
2	1102.4	10.44
3	433.3	11.62
4	513.0	12.22
5	569.5	10.66
6	224.1	11.60
7	259.0	10.80
8	313.8	11.28
9	74.7	7.52
10	85.2	6.72
11	91.0	6.72
12	37.0	3.58
13	40.0	3.52
14	47.2	3.42
15	18.3	1.84
16	21.3	1.72
17	23.4	1.82
18	8.4	.62
19	9.8	.70
20	10.7	.64

Cruise : 83-04 Station : 50
Depth : 3.9 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	964.6	21.34
2	1549.1	21.26
3	1607.2	20.44
4	539.6	19.18
5	742.2	17.80
6	938.1	20.76
7	282.3	19.42
8	357.0	17.80
9	383.5	16.20
10	90.3	7.28
11	111.1	7.62
12	116.2	7.16
13	49.5	3.16
14	56.6	2.60
15	66.6	2.90
16	24.2	1.04
17	27.2	.92
18	27.4	1.00
19	9.0	.18
20	12.0	.14
21	12.4	.16

Cruise : 83-04 Station : 55
Depth : 18.1 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	710.6	7.66
2	1102.4	6.20
3	433.3	6.52
4	513.0	5.90
5	569.5	6.24
6	224.1	5.42
7	259.0	6.04
8	313.8	5.66
9	74.7	4.48
10	85.2	5.80
11	91.0	4.50
12	37.0	2.66
13	40.0	2.76
14	47.2	2.70
15	18.3	1.32
16	21.3	1.18
17	23.4	1.20
18	8.4	.48
19	9.8	.42
20	10.7	.44

Cruise : 83-04 Station : 55
Depth : 4.6 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	964.6	7.72
2	1549.1	7.54
3	1607.2	7.40
4	539.6	8.52
5	742.2	10.60
6	938.1	7.30
7	282.3	7.10
8	357.0	10.80
9	383.5	7.98
10	90.3	4.32
11	111.1	2.42
12	116.2	3.90
13	49.5	1.78
14	56.6	1.70
15	66.6	1.52
16	24.2	3.12
17	27.2	.38
18	27.4	.38
19	9.0	.14
20	12.0	.14
21	12.4	.14

Cruise : 83-04 Station : 62
Depth : 12.2 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	710.6	3.30
2	946.4	3.42
3	1102.4	3.06
4	433.3	3.04
5	569.5	2.94
6	259.0	2.74
7	313.8	2.74
8	74.7	2.88
9	85.2	1.76
10	91.0	1.52
11	37.0	.88
12	40.0	.72
13	47.2	.74
14	18.3	.30
15	21.3	.30
16	23.4	.22
17	8.4	.08
18	9.8	.06
19	10.7	.32

Cruise : 83-04 Station : 73
Depth : 31.2 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	710.6	7.96
2	946.4	6.76
3	1102.4	5.56
4	433.3	6.64
5	513.0	7.34
6	569.5	8.06
7	259.0	8.66
8	313.8	8.26
9	74.7	7.78
10	85.2	7.12
11	91.0	6.72
12	37.0	4.30
13	40.0	3.52
14	47.2	5.00
15	18.3	2.00
16	21.3	1.06
17	23.4	2.10
18	8.4	.82
19	9.8	.80
20	10.7	.90

Cruise : 83-04 Station : 73
Depth : 9.6 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	964.6	18.70
2	1549.1	21.92
3	1607.2	15.52
4	539.6	19.76
5	742.2	14.34
6	938.1	11.88
7	282.3	16.20
8	357.0	14.74
9	383.5	18.76
10	90.3	9.12
11	111.1	7.84
12	116.2	7.66
13	49.5	2.24
14	56.6	2.22
15	66.6	.48
16	24.2	2.42
17	27.2	.82
18	27.4	.82
19	9.0	.12
20	12.4	.08

Cruise : 83-04 Station : 79
Depth : 19.5 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	964.6	7.80
2	1549.1	6.32
3	1607.2	6.42
4	539.6	8.04
5	742.2	9.14
6	938.1	8.84
7	357.0	8.42
8	383.5	7.90
9	90.3	7.50
10	111.1	6.26
11	116.2	5.92
12	49.5	3.72
13	56.6	3.62
14	66.6	3.10
15	24.2	1.42
16	27.2	1.82
17	27.4	1.80
18	9.0	.50
19	12.0	.46
20	12.4	.48

Cruise : 83-04 Station : 92
Depth : 14.0 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	964.6	16.60
2	1549.1	15.54
3	1607.2	16.06
4	539.6	15.22
5	742.2	15.80
6	938.1	14.94
7	282.3	14.66
8	357.0	14.24
9	383.5	15.60
10	90.3	9.90
11	111.1	8.72
12	116.2	8.68
13	49.5	4.72
14	56.6	3.90
15	66.6	4.42
16	24.2	1.84
17	27.2	1.78
18	27.4	1.60
19	9.0	.44
20	12.0	.36
21	12.4	.32

Cruise : 83-04 Station : 94
Depth : 29.5 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	710.6	12.26
2	946.4	11.64
3	1102.4	11.88
4	433.3	11.14
5	513.0	11.02
6	569.5	10.26
7	224.1	10.14
8	259.0	10.06
9	313.8	9.04
10	74.7	5.86
11	85.2	5.90
12	91.0	6.24
13	37.0	3.34
14	40.0	2.80
15	47.2	3.20
16	18.3	1.48
17	21.3	1.48
18	23.4	1.02
19	8.4	.62
20	9.8	.66
21	10.7	.58

Cruise : 83-04 Station : 94
Depth : 8.5 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	964.6	10.74
2	1549.1	13.30
3	1607.2	13.84
4	539.6	11.80
5	742.2	11.44
6	938.1	13.34
7	282.3	10.60
8	357.0	10.46
9	383.5	7.32
10	90.3	6.06
11	111.1	4.60
12	116.2	3.88
13	49.5	2.88
14	56.6	2.36
15	66.6	2.30
16	24.2	1.06
17	27.2	.88
18	27.4	.72
19	9.0	.22
20	12.0	.26
21	12.4	.22

Cruise : 83-04 Station : 96 A
Depth : 19.6 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	964.6	6.40
2	1549.1	7.40
3	1607.2	6.92
4	539.6	8.04
5	742.2	8.10
6	938.1	6.52
7	282.3	6.50
8	357.0	6.44
9	383.5	6.96
10	90.3	5.18
11	111.1	4.80
12	116.2	4.62
13	49.5	2.68
14	56.6	2.32
15	66.6	2.34
16	24.2	1.18
17	27.2	1.26
18	27.4	1.24
19	9.0	.48
20	12.0	.44
21	12.4	.42

Cruise : 83-04 Station : 96 D
Depth : 27.1 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	964.6	6.24
2	1549.1	5.78
3	1607.2	5.64
4	539.6	6.52
5	742.2	6.36
6	938.1	5.74
7	282.3	6.10
8	357.0	5.54
9	383.5	5.20
10	90.3	3.64
11	111.1	3.84
12	116.2	3.94
13	49.5	2.70
14	56.6	2.12
15	66.6	2.16
16	24.2	1.18
17	27.2	.98
18	27.4	.92
19	9.0	.38
20	12.0	.34
21	12.4	.30

Cruise : 83-04 Station : 96 G
Depth : 30.1 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	964.6	3.34
2	1549.1	2.72
3	1607.2	3.84
4	539.6	3.94
5	742.2	4.06
6	938.1	4.42
7	282.3	3.92
8	357.0	3.46
9	383.5	3.52
10	90.3	2.34
11	111.1	2.46
12	116.2	2.22
13	49.5	1.36
14	56.6	1.34
15	66.6	1.40
16	24.2	.70
17	27.2	.70
18	27.4	.74
19	9.0	.24
20	12.0	.24
21	12.4	.26

Cruise : 83-04 Station : 96 J
Depth : 27.1 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	964.6	4.60
2	1549.1	4.96
3	1607.2	4.34
4	539.6	5.56
5	742.2	5.52
6	938.1	5.50
7	282.3	5.42
8	357.0	4.28
9	90.3	2.98
10	111.1	2.82
11	116.2	2.88
12	49.5	1.74
13	56.6	1.66
14	66.6	1.34
15	24.2	.64
16	27.2	.64
17	27.4	.56
18	9.0	.22
19	12.0	.22
20	12.4	.22

Cruise : 83-04 Station : 96 M
Depth : 28.7 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	964.6	5.86
2	1549.1	4.46
3	1607.2	4.44
4	539.6	6.88
5	742.2	5.94
6	938.1	5.58
7	282.3	6.70
8	357.0	6.54
9	383.5	6.24
10	90.3	4.18
11	111.1	4.30
12	116.2	4.04
13	49.5	2.46
14	56.6	2.20
15	66.6	2.20
16	24.2	1.16
17	27.2	1.02
18	27.4	.96
19	9.0	.44
20	12.0	.40
21	12.4	.40

Cruise : 83-04 Station : 96 P
Depth : 26.2 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	964.6	9.20
2	1549.1	7.94
3	1607.2	8.20
4	539.6	8.66
5	742.2	8.10
6	938.1	8.92
7	282.3	8.12
8	357.0	8.36
9	383.5	7.64
10	90.3	6.16
11	111.1	5.82
12	116.2	6.00
13	49.5	3.90
14	56.6	3.52
15	66.6	3.26
16	24.2	1.56
17	27.2	1.50
18	27.4	1.56
19	9.0	.66
20	12.0	.60
21	12.4	.52

Cruise : 83-04 Station : 96 S
Depth : 25.4 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	964.6	6.20
2	1549.1	4.88
3	1607.2	5.32
4	539.6	5.22
5	742.2	5.70
6	938.1	5.58
7	282.3	6.38
8	357.0	5.90
9	383.5	5.42
10	90.3	4.70
11	111.1	4.46
12	116.2	4.28
13	49.5	2.42
14	56.6	2.08
15	66.6	2.20
16	24.2	1.08
17	27.2	1.04
18	27.4	1.00
19	9.0	.44
20	12.0	.38
21	12.4	.40

Cruise : 83-04 Station : 96 V
Depth : 19.6 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	964.6	6.96
2	1549.1	6.56
3	1607.2	6.58
4	539.6	7.30
5	742.2	8.04
6	938.1	6.88
7	282.3	6.34
8	357.0	6.08
9	383.5	6.24
10	90.3	4.84
11	116.2	4.46
12	49.5	2.42
13	56.6	2.34
14	66.6	2.16
15	24.2	1.18
16	27.2	1.20
17	27.4	1.10
18	9.0	.50
19	12.0	.46
20	12.4	.46

Cruise : 83-04 Station : 96 Y
Depth : 22.1 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	964.6	4.34
2	1549.1	3.64
3	1607.2	3.48
4	539.6	4.12
5	742.2	3.96
6	938.1	3.96
7	282.3	4.44
8	357.0	4.12
9	383.5	3.88
10	90.3	3.28
11	111.1	2.82
12	116.2	3.42
13	49.5	1.98
14	56.6	1.76
15	66.6	1.82
16	24.2	.98
17	27.2	.80
18	27.4	.90
19	9.0	.30
20	12.0	.26
21	12.4	.28

Cruise : 83-04 Station : 101
Depth : 9.3 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	964.6	4.12
2	1549.1	3.86
3	1607.2	3.66
4	539.6	3.68
5	742.2	3.54
6	938.1	3.36
7	282.3	3.88
8	357.0	3.46
9	383.5	3.22
10	90.3	2.92
11	111.1	2.48
12	116.2	2.14
13	49.5	1.28
14	56.6	1.30
15	66.6	1.42
16	24.2	.80
17	27.2	.74
18	27.4	.96
19	9.0	.36
20	12.0	.14
21	12.4	.20

Cruise : 83-04 Station : 104
Depth : 10.1 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	710.6	4.70
2	946.4	4.74
3	1102.4	4.12
4	433.3	5.24
5	513.0	5.16
6	569.5	4.78
7	224.1	4.02
8	259.0	3.74
9	313.8	3.08
10	74.7	2.34
11	85.2	2.32
12	91.0	2.36
13	37.0	1.40
14	40.0	1.02
15	47.2	1.14
16	18.3	.42
17	21.3	.42
18	23.4	.44
19	8.4	.08
20	9.8	.12
21	10.7	.08

Cruise : 83-04 Station : 107
Depth : 10.2 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	710.6	7.04
2	946.4	7.24
3	1102.4	6.62
4	433.3	7.08
5	513.0	6.52
6	569.5	6.26
7	224.1	6.34
8	259.0	6.26
9	313.8	5.82
10	74.7	3.82
11	85.2	3.82
12	91.0	3.34
13	37.0	1.96
14	40.0	1.90
15	47.2	1.76
16	18.3	.96
17	21.3	.88
18	23.4	.78
19	8.4	.40
20	9.8	.32
21	10.7	.36

Cruise : 83-04 Station : 110
Depth : 9.6 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	964.6	8.54
2	1549.1	6.54
3	1607.2	5.72
4	539.6	8.50
5	742.2	7.74
6	938.1	7.60
7	282.3	7.36
8	357.0	7.10
9	383.5	7.42
10	90.3	5.44
11	111.1	4.92
12	116.2	4.70
13	49.5	2.90
14	56.6	2.52
15	66.6	2.36
16	24.2	1.18
17	27.2	1.00
18	27.4	.94
19	9.0	.38
20	12.0	.36
21	12.4	.34

Cruise : 83-04 Station : 113
Depth : 9.0 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	964.6	9.02
2	1549.1	8.02
3	1607.2	12.04
4	539.6	11.88
5	742.2	11.80
6	938.1	10.28
7	282.3	11.34
8	357.0	11.38
9	383.5	12.12
10	90.3	7.80
11	111.1	5.30
12	116.2	5.44
13	49.5	2.98
14	56.6	2.58
15	66.6	2.76
16	24.2	2.84
17	27.2	.84
18	27.4	.84
19	9.0	.18
20	12.0	.16
21	12.4	.12

Cruise : 83-04 Station : 119
Depth : 27.4 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	964.6	11.54
2	1549.1	11.32
3	1607.2	11.26
4	539.6	9.26
5	742.2	9.60
6	938.1	10.58
7	282.3	9.44
8	357.0	9.26
9	383.5	9.76
10	90.3	4.50
11	111.1	4.44
12	116.2	5.42
13	49.5	2.98
14	56.6	3.60
15	66.6	3.18
16	24.2	1.48
17	27.2	1.48
18	27.4	1.44
19	9.0	.58
20	12.0	.68
21	12.4	.74

Cruise : 83-04 Station : 122
Depth : 8.8 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	964.6	7.30
2	1549.1	7.64
3	1607.2	7.06
4	938.1	7.68
5	282.3	4.88
6	357.0	4.54
7	383.5	4.84
8	111.1	3.18
9	116.2	4.06
10	49.5	1.82
11	56.6	1.60
12	66.6	1.30
13	27.2	.48
14	27.4	.50
15	9.0	.18
16	12.0	.12
17	12.4	.10

Cruise : 83-04 Station : 125
Depth : 9.3 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	964.6	5.14
2	1549.1	4.28
3	1607.2	4.64
4	539.6	6.76
5	742.2	6.22
6	938.1	6.54
7	282.3	3.66
8	383.5	4.50
9	90.5	3.94
10	111.1	3.12
11	116.2	4.30
12	49.5	1.68
13	56.6	1.38
14	66.6	1.06
15	24.2	.86
16	27.2	.36
17	27.4	1.50
18	9.0	.02
19	12.0	.08
20	12.4	.72

Cruise : 83-04 Station : 129
Depth : 20.4 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	964.6	6.32
2	1549.1	4.64
3	742.2	5.56
4	938.1	4.68
5	282.3	6.16
6	357.0	6.12
7	383.5	5.94
8	90.3	4.08
9	111.1	3.54
10	116.2	3.44
11	49.5	2.14
12	56.6	2.02
13	66.6	1.98
14	24.2	.96
15	27.2	1.20
16	27.4	1.84
17	9.0	.74
18	12.0	.32
19	12.4	.32

Cruise : 83-04 Station : 129
Depth : 9.8 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	946.4	3.02
2	1102.4	4.38
3	433.3	4.10
4	513.0	4.12
5	569.5	4.00
6	259.0	2.92
7	313.8	3.34
8	74.7	2.80
9	85.2	2.26
10	91.0	1.88
11	37.0	.64
12	40.0	2.66
13	47.2	1.26
14	18.3	1.88
15	21.3	1.00
16	23.4	.06
17	8.4	1.64
18	10.7	.92

Cruise : 83-04 Station : 131
Depth : 25.1 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	964.6	6.52
2	1549.1	6.18
3	1607.2	5.62
4	539.6	7.96
5	938.1	7.14
6	282.3	7.50
7	357.0	6.14
8	383.5	7.66
9	90.3	3.84
10	111.1	4.54
11	116.2	4.80
12	49.5	2.68
13	56.6	2.50
14	66.6	2.06
15	24.2	2.60
16	27.2	.98
17	27.4	.98
18	9.0	.42
19	12.0	.60
20	12.4	.52

Cruise : 83-04 Station : 07.11/1452
Depth : 0.0 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	710.6	9.78
2	946.4	9.06
3	282.3	6.74
4	282.3	7.24
5	166.0	4.50
6	166.0	5.48
7	74.7	1.58
8	85.2	1.44
9	37.0	.58
10	40.0	.36
11	18.3	.08
12	21.3	.06
13	8.4	1.24
14	9.8	.66

Cruise : 83-04 Station : 07.11/1958
Depth : 0.0 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	946.4	12.90
2	433.3	13.40
3	513.0	13.86
4	224.1	11.00
5	259.0	10.78
6	74.7	5.72
7	85.2	4.56
8	37.0	1.54
9	40.0	2.40
10	18.3	.54
11	21.3	1.34
12	8.4	.58
13	9.8	1.06

Cruise : 83-04 Station : 07.12/1059
Depth : 0.0 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	710.6	15.94
2	946.4	18.14
3	282.3	12.64
4	282.3	8.98
5	166.0	4.76
6	74.7	3.42
7	85.2	3.70
8	37.0	.49
9	40.0	.56
10	18.3	.71
11	21.3	.25
12	8.4	.11

Cruise : 83-04 Station : 07.13/1032
Depth : 0.0 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	710.6	8.48
2	946.4	9.26
3	433.3	10.04
4	513.0	12.64
5	259.0	7.12
6	74.7	2.28
7	85.2	2.28
8	37.0	.58
9	40.0	.56
10	18.3	.10
11	21.3	.74
12	8.4	.50
13	9.8	1.22

Cruise : 83-04 Station : 07.13/1535
Depth : 0.0 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	710.6	22.64
2	946.6	25.06
3	433.3	23.76
4	513.0	23.76
5	224.1	20.12
6	259.0	19.02
7	74.7	5.58
8	85.2	6.94
9	37.0	3.02
10	40.0	2.54
11	18.3	1.82
12	21.3	.98
13	8.4	.26
14	9.8	.88

Cruise : 83-04 Station : 07.14/1250
Depth : 0.0 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	710.6	19.06
2	946.4	20.70
3	433.3	19.46
4	513.0	20.54
5	224.1	15.74
6	259.0	13.68
7	74.7	6.02
8	85.2	5.74
9	37.0	1.72
10	40.0	2.06
11	18.3	1.04
12	21.3	.78
13	9.8	.28

Cruise : 83-04 Station : 07.15/1145
Depth : 0.0 m

Subsample	Light int. [uEin.s-1.m-2]	Productivity [mg C.(mg Chl a)-1.hr-1]
1	710.6	12.82
2	946.4	15.88
3	433.3	19.66
4	513.0	14.76
5	224.1	10.60
6	259.0	13.86
7	74.7	4.64
8	85.2	5.74
9	37.0	2.40
10	40.0	2.72
11	18.3	.68
12	21.3	1.56
13	8.4	.02
14	9.8	.00

Cruise : 83-04	Date:	83.06.30	Depth:	0.0	m
Station: P-08	Time:	1109 (LAT)	Chlorophyll a:	.21	mg.m-3
		1220 (PDT)	Dis. Inorg. C:	2.51E+04	mg.m-3

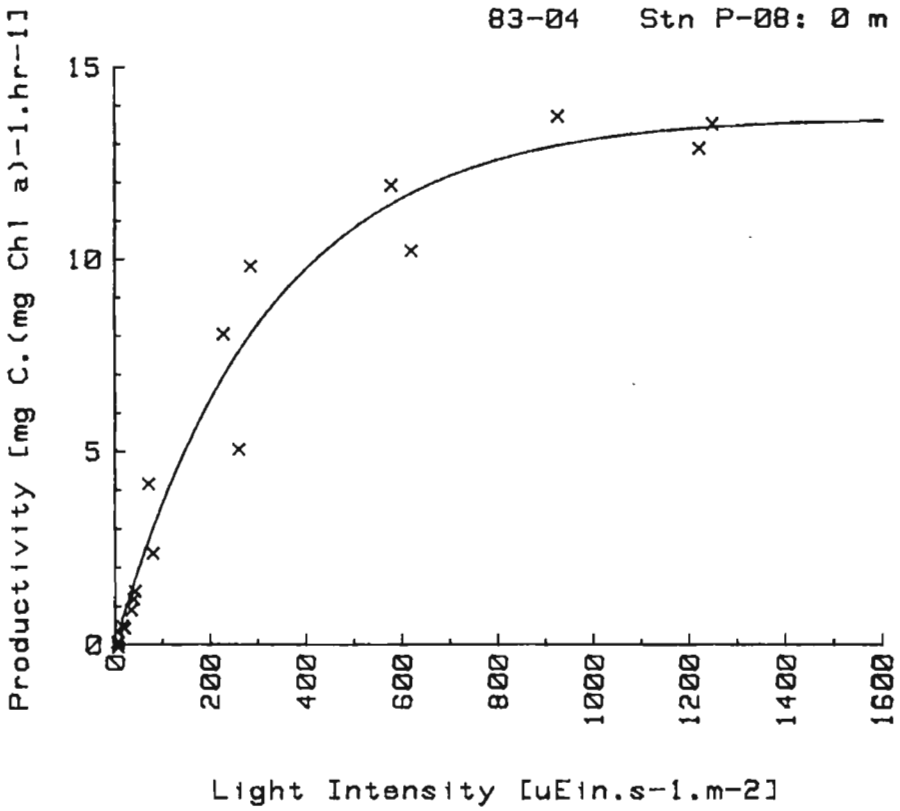
Final estimates +/- 90% confidence limits:

Psb	=	13.850	+/-	11.044
Alpha	=	.042	+/-	.012
Beta	=	.0001	+/-	.0086

Derived parameters:

Pm = 13.60
Im = 1950.7
Is = 327.0
Ib = 1.27E+05

n = 18
r = .979 with 14 degrees of freedom


83-04 Stn P-08: 0 m
Productivity [mg C.(mg Chl a)-1.hr-1]
15
10
5
0
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]

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Cruise : 83-04        Date:  83.07.01              Depth: 19.7       m
Station: 20           Time:  1321 (LAT)    Chlorophyll a:  3.31      mg.m-3
                             1434 (PDT)    Dis. Inorg. C:  2.37E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   12.539   +/-   6.659
              Alpha =     .061   +/-    .010
              Beta  =     .0048  +/-    .0103


          Derived parameters:
                 Pm =    9.43
                 Im =  539.2
                 Is =  207.1
                 Ib =    2.59E+03


                 n =   21
                 r =     .985 with 17 degrees of freedom
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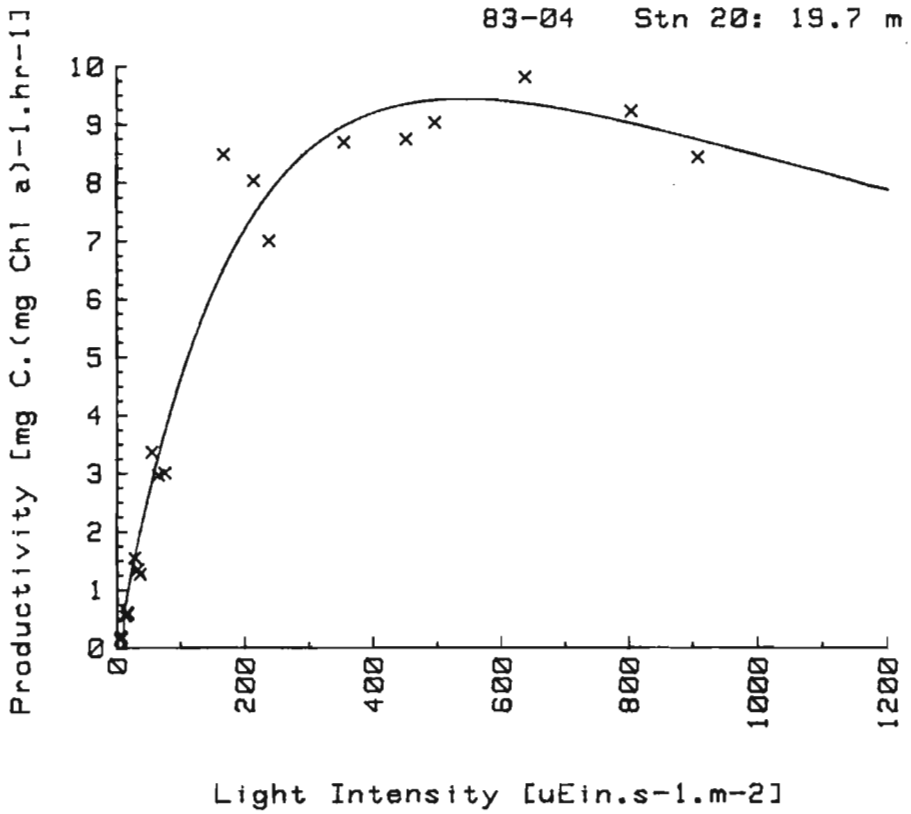
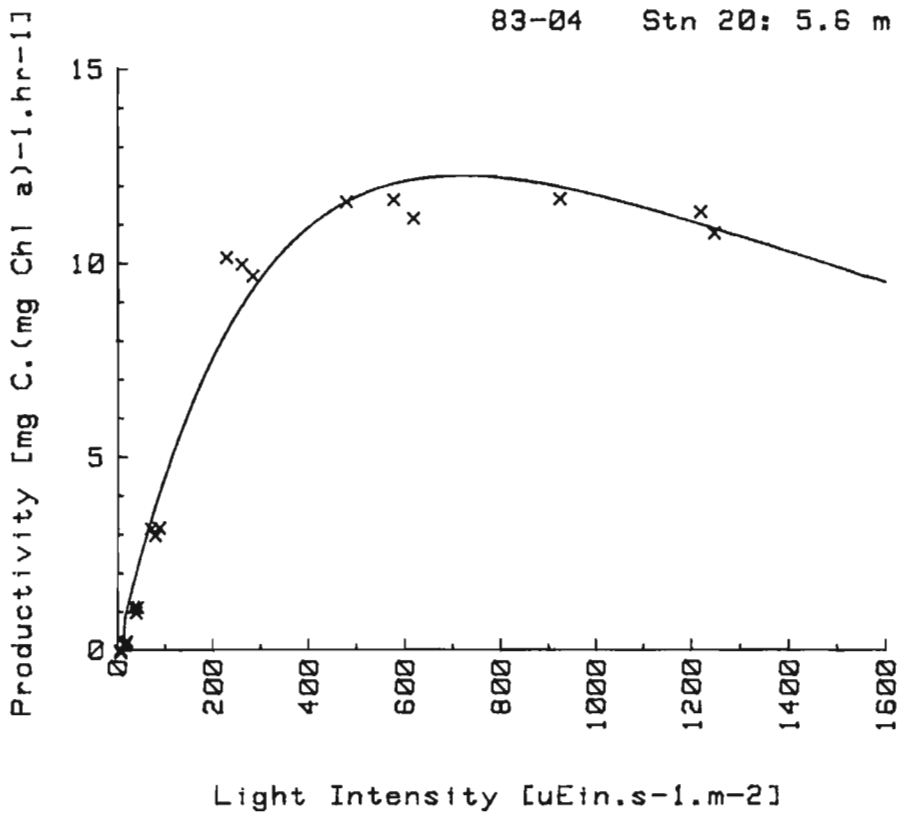
Cruise : 83-04        Date:  83.07.01              Depth:  5.6       m
Station: 20           Time:  1323 (LAT)    Chlorophyll a:  1.07      mg.m-3
                             1436 (PDT)    Dis. Inorg. C:  2.32E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   19.600   +/-  21.028
              Alpha =     .054   +/-    .009
              Beta  =     .0087  +/-    .0238


          Derived parameters:
                 Pm =   12.26
                 Im =  718.7
                 Is =  364.7
                 Ib =    2.25E+03


                 n =   21
                 r =     .986 with 17 degrees of freedom
```


83-04 Stn 20: 19.7 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
9
10
0
200
400
600
800
1000
1200
Light Intensity [uEin.s-1.m-2]

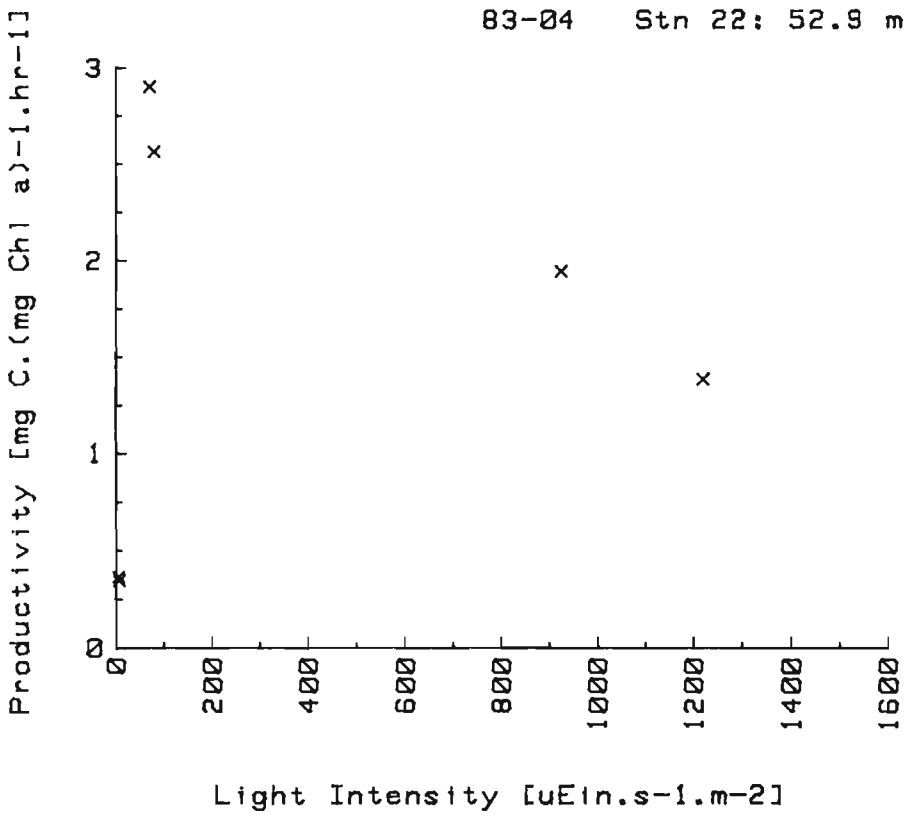

83-04 Stn 20: 5.6 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
5
10
15
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]

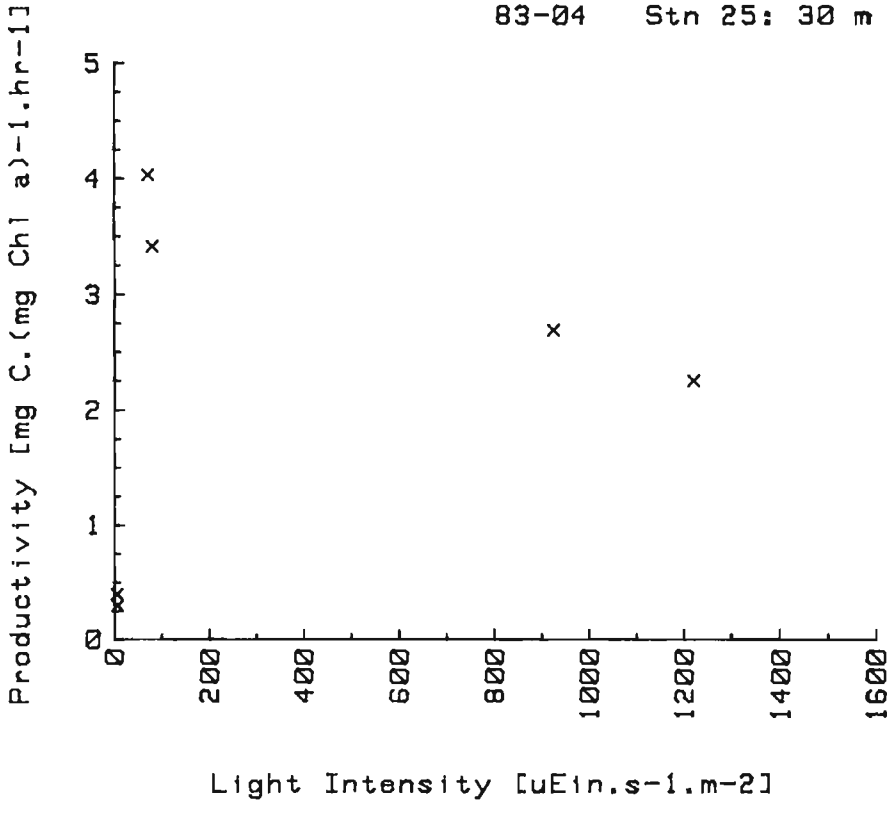
Cruise : 83-04	Date:	83.07.01	Depth:	52.9	m
Station: 22	Time:	2300 (LAT)	Chlorophyll a:	.75	mg.m-3
		0030 (PDT)	Dis. Inorg. C:	2.56E+04	mg.m-3

Number of data points: 6

Cruise : 83-04	Date:	83.07.02	Depth:	30.0	m
Station: 25	Time:	0238 (LAT)	Chlorophyll a:	.74	mg.m-3
		0407 (PDT)	Dis. Inorg. C:	2.54E+04	mg.m-3

Number of data points: 6


83-04 Stn 22: 52.9 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]


83-04 Stn 25: 30 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]

Cruise : 83-04	Date:	83.07.02	Depth:	3.7	m
Station: 34	Time:	1434 (LAT)	Chlorophyll a:	.75	mg.m-3
		1605 (PDT)	Dis. Inorg. C:	2.28E+04	mg.m-3

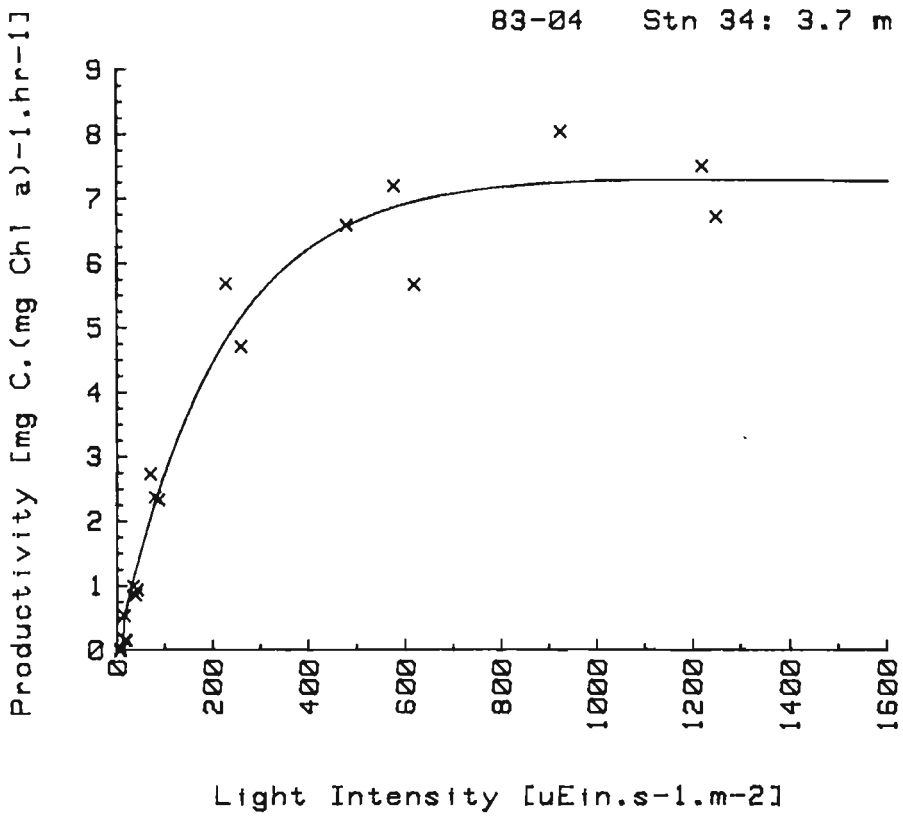
Final estimates +/- 90% confidence limits:

Psb	=	7.482	+/-	2.522
Alpha	=	.034	+/-	.008
Beta	=	.0001	+/-	.0024

Derived parameters:

Pm = 7.28
Im = 1207.9
Is = 220.4
Ib = 5.26E+04

n = 19
r = .982 with 15 degrees of freedom

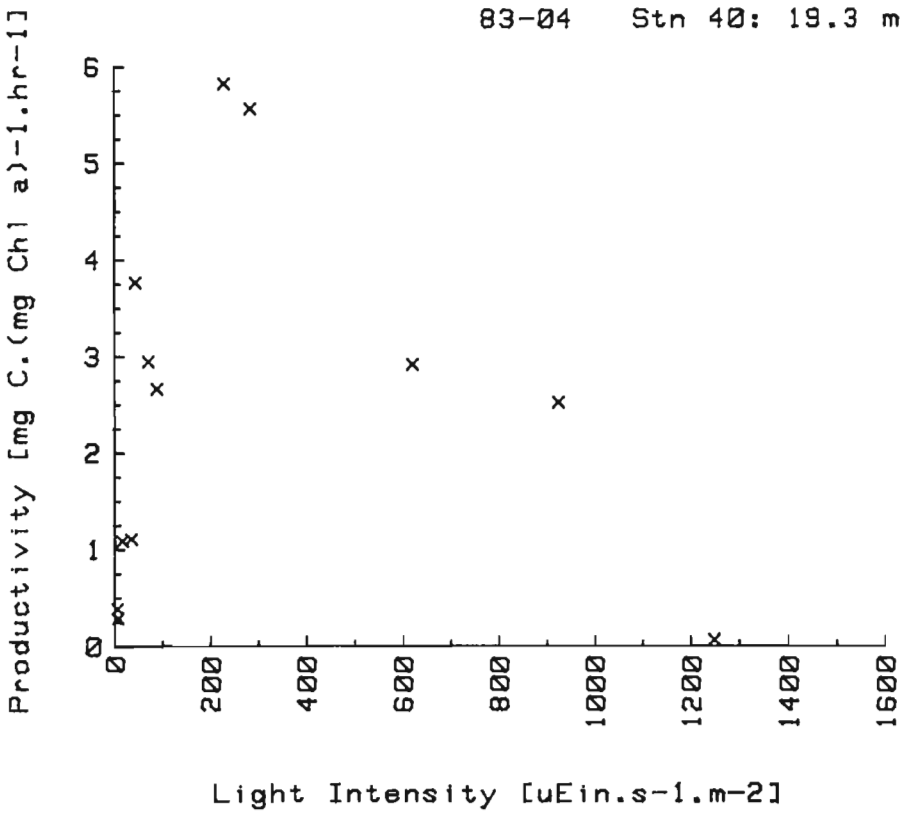

83-04 Stn 34: 3.7 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
9
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]

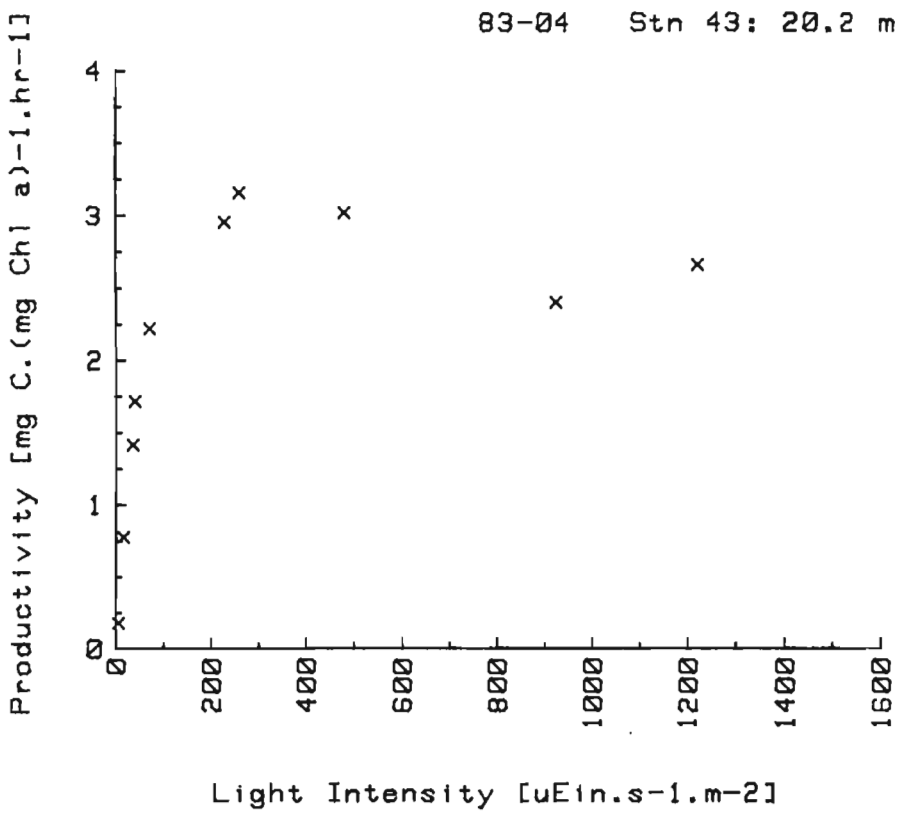
Cruise : 83-04	Date:	83.07.02	Depth:	19.3	m
Station: 40	Time:	2216 (LAT)	Chlorophyll a:	.67	mg.m-3
		2350 (PDT)	Dis. Inorg. C:	2.48E+04	mg.m-3

Number of data points: 12

Cruise : 83-04	Date:	83.07.03	Depth:	20.2	m
Station: 43	Time:	0155 (LAT)	Chlorophyll a:	.88	mg.m-3
		0327 (PDT)	Dis. Inorg. C:	2.37E+04	mg.m-3

Number of data points: 10


83-04 Stn 40: 19.3 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]


83-04 Stn 43: 20.2 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-04        Date:  83.07.03              Depth: 16.8       m
Station: 50           Time:  0817 (LAT)    Chlorophyll a:  1.41      mg.m-3
                             0947 (PDT)    Dis. Inorg. C:  2.42E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   13.435   +/-   1.596
              Alpha =     .112   +/-    .012
              Beta  =     .0034  +/-    .0026

          Derived parameters:
                 Pm =   11.71
                 Im =  423.9
                 Is =  120.4
                 Ib =    3.95E+03

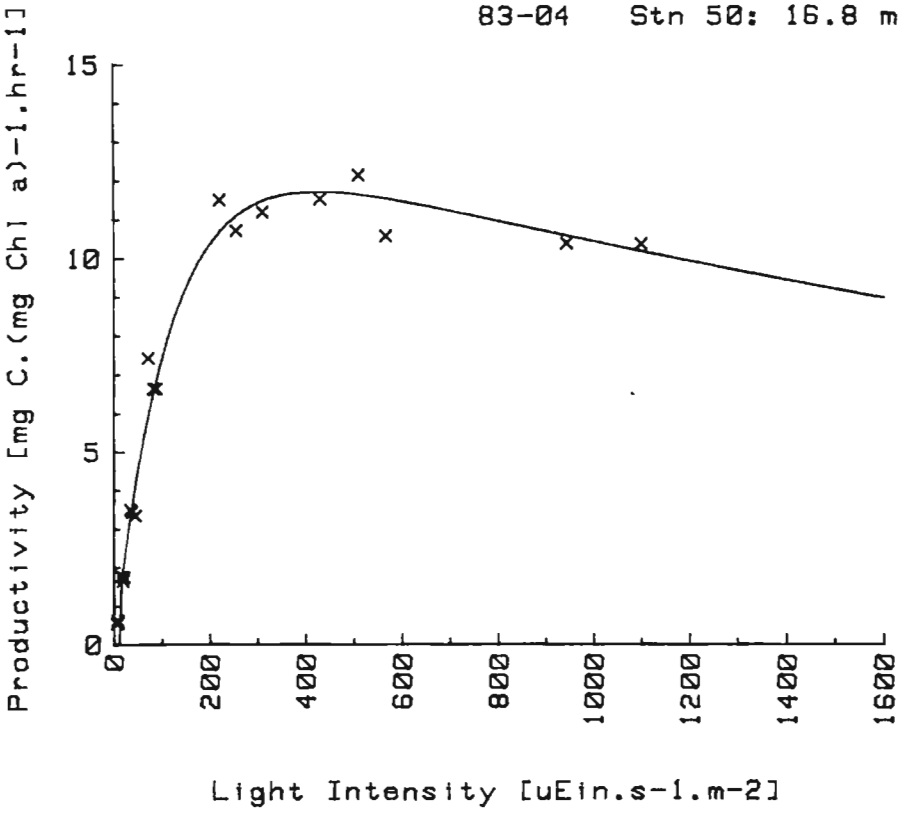

                 n =   20
                 r =     .991 with 16 degrees of freedom
```

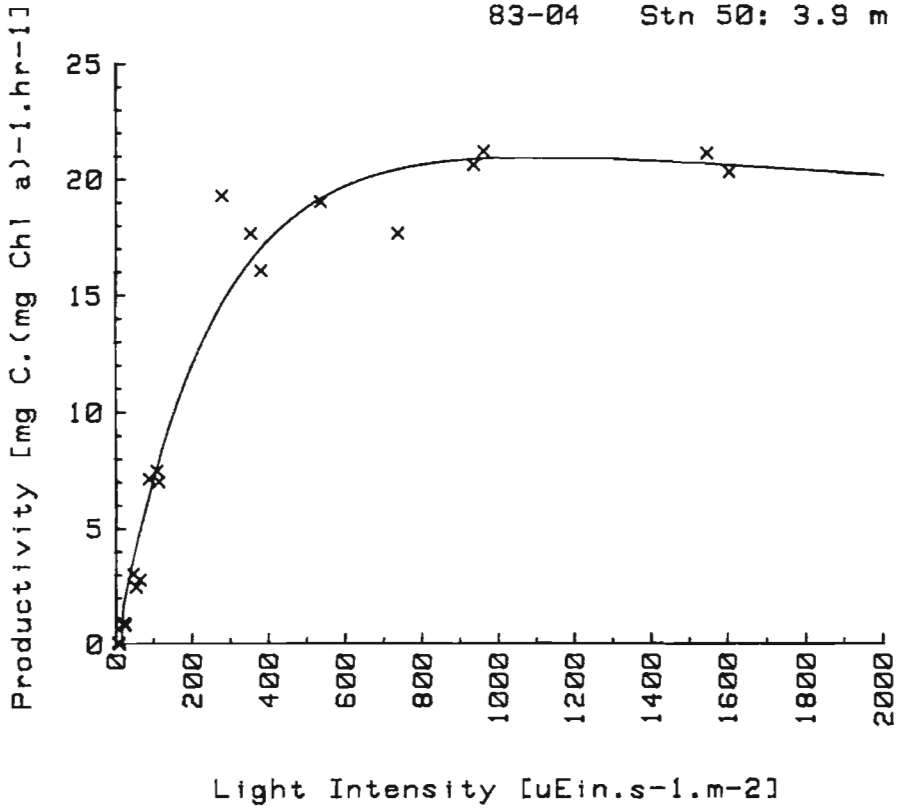
```
Cruise : 83-04        Date:  83.07.03              Depth:  3.9       m
Station: 50           Time:  0818 (LAT)    Chlorophyll a:  3.12      mg.m-3
                             0948 (PDT)    Dis. Inorg. C:  2.42E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   22.693   +/-   6.635
              Alpha =     .087   +/-    .017
              Beta  =     .0013  +/-    .0054

          Derived parameters:
                 Pm =   20.95
                 Im = 1092.8
                 Is =  261.2
                 Ib =    1.69E+04


                 n =   21
                 r =     .982 with 17 degrees of freedom
```


83-04 Stn 50: 16.8 m
Productivity [mg C.(mg Chl a)-1.hr-1]
15
10
5
0
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]


83-04 Stn 50: 3.9 m
Productivity [mg C.(mg Chl a)-1.hr-1]
25
20
15
10
5
0
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-04        Date:  83.07.03              Depth: 18.1       m
Station: 55           Time:  1433 (LAT)    Chlorophyll a:  3.12      mg.m-3
                             1605 (PDT)    Dis. Inorg. C:  2.41E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    6.158   +/-    .934
              Alpha =     .090   +/-    .018
              Beta  =     .0000  +/-    .0015


          Derived parameters:
                 Pm =    6.15
                 Im =  622.2
                 Is =   68.3
                 Ib =    6.16E+05

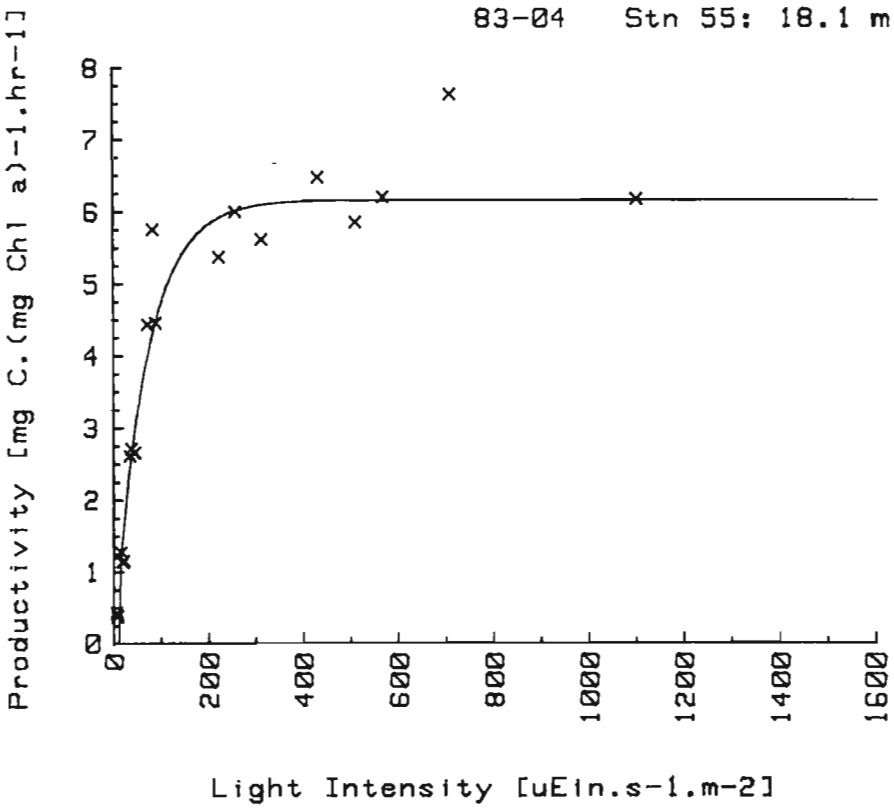

                 n =   20
                 r =     .968 with 16 degrees of freedom
```

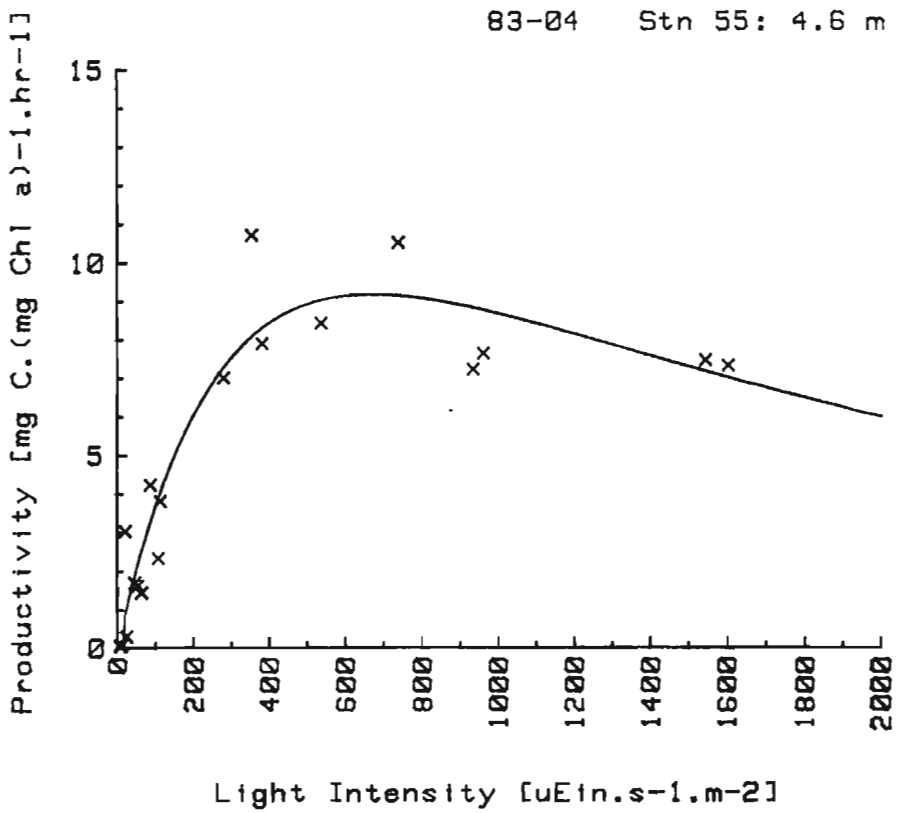
```
Cruise : 83-04        Date:  83.07.03              Depth:  4.6       m
Station: 55           Time:  1434 (LAT)    Chlorophyll a:  1.01      mg.m-3
                             1606 (PDT)    Dis. Inorg. C:  2.39E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   13.534   +/-   9.755
              Alpha =     .045   +/-    .012
              Beta  =     .0055  +/-    .0110


          Derived parameters:
                 Pm =    9.18
                 Im =  668.6
                 Is =  302.5
                 Ib =    2.46E+03


                 n =   21
                 r =     .948 with 17 degrees of freedom
```


83-04 Stn 55: 18.1 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]


83-04 Stn 55: 4.6 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
5
10
15
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

Cruise : 83-04	Date:	83.07.04	Depth:	12.2	m
Station: 62	Time:	0729 (LAT)	Chlorophyll a:	2.05	mg.m-3
		0855 (PDT)	Dis. Inorg. C:	2.41E+04	mg.m-3

Final estimates +/- 90% confidence limits:

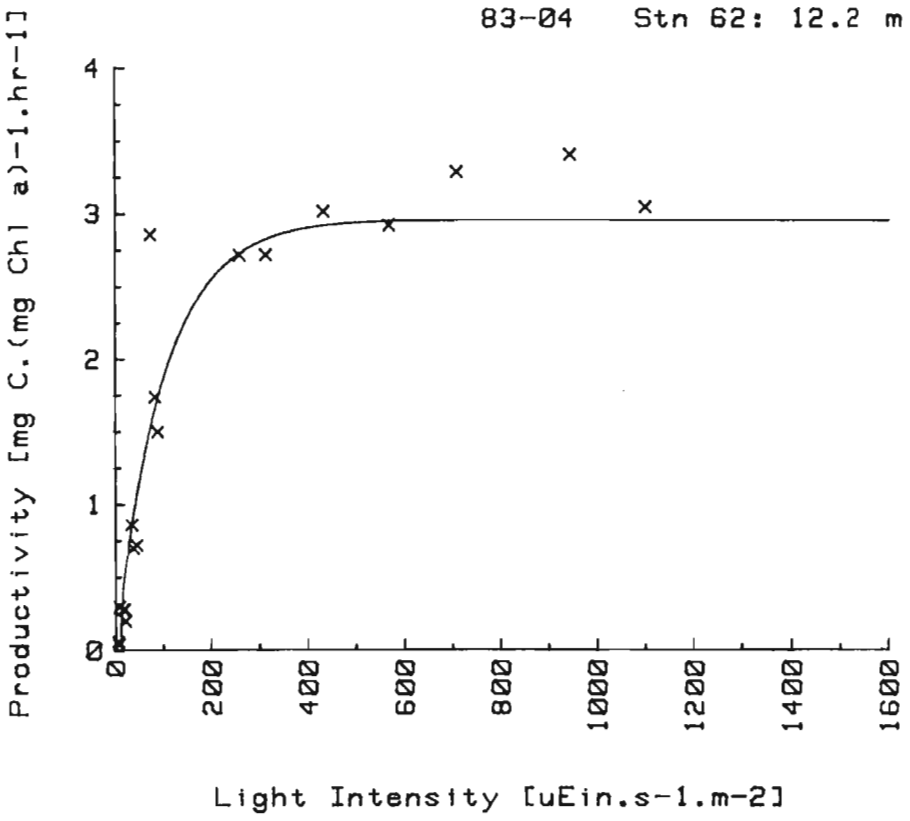
Psb	=	2.964	+/-	.885
Alpha	=	.029	+/-	.009
Beta	=	.0000	+/-	.0012

Derived parameters:

Pm	=	2.95
Im	=	806.4
Is	=	101.0
Ib	=	2.96E+05

n = 19

r = .948 with 15 degrees of freedom


83-04 Stn 62: 12.2 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-04        Date:  83.07.05              Depth: 31.2       m
Station: 73           Time:  0716 (LAT)    Chlorophyll a:   .97      mg.m-3
                             0851 (PDT)    Dis. Inorg. C:  2.66E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    9.728   +/-   1.588
              Alpha =     .140   +/-    .023
              Beta  =     .0043  +/-    .0032


          Derived parameters:
                 Pm =    8.48
                 Im =  244.4
                 Is =   69.4
                 Ib =    2.28E+03

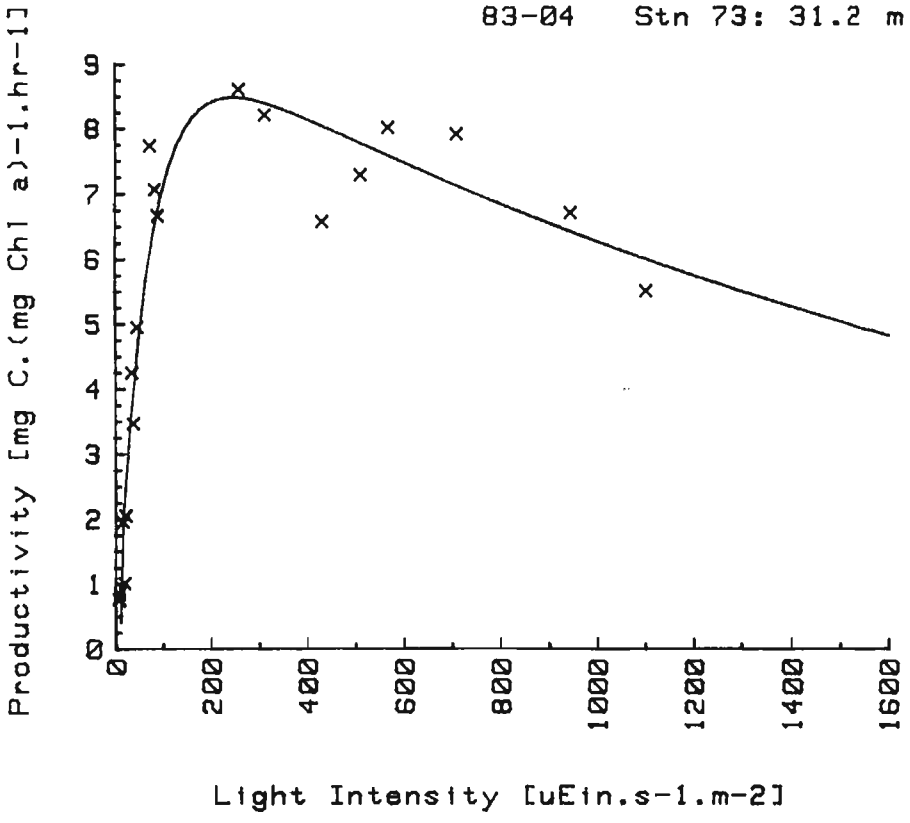

                 n =   20
                 r =     .964 with 16 degrees of freedom
```

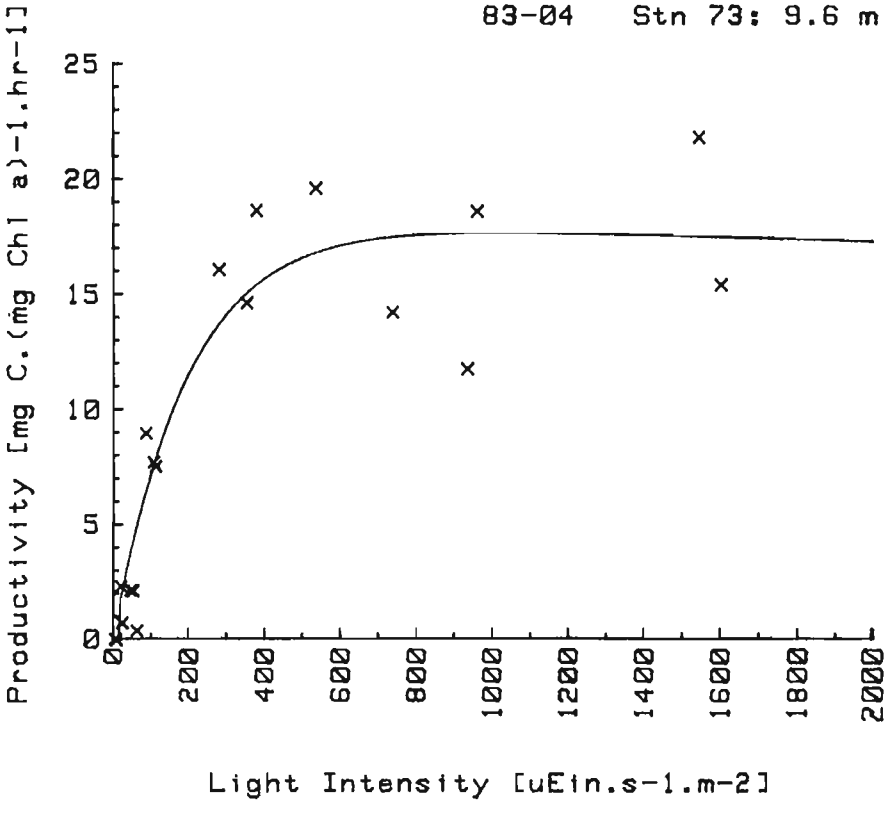
```
Cruise : 83-04        Date:  83.07.05              Depth:  9.6       m
Station: 73           Time:  0716 (LAT)    Chlorophyll a:   .19      mg.m-3
                             0851 (PDT)    Dis. Inorg. C:  2.58E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   18.320   +/-   7.732
              Alpha =     .091   +/-    .035
              Beta  =     .0005  +/-    .0066


          Derived parameters:
                 Pm =   17.66
                 Im = 1029.3
                 Is =  200.6
                 Ib =    3.37E+04


                 n =   20
                 r =     .931 with 16 degrees of freedom
```


83-04 Stn 73: 31.2 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
9
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]


83-04 Stn 73: 9.6 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
5
10
15
20
25
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

Cruise : 83-04	Date:	83.07.05	Depth:	19.5	m
Station: 79	Time:	1842 (LAT)	Chlorophyll a:	1.09	mg.m-3
		2019 (PDT)	Dis. Inorg. C:	2.48E+04	mg.m-3

Final estimates +/- 90% confidence limits:

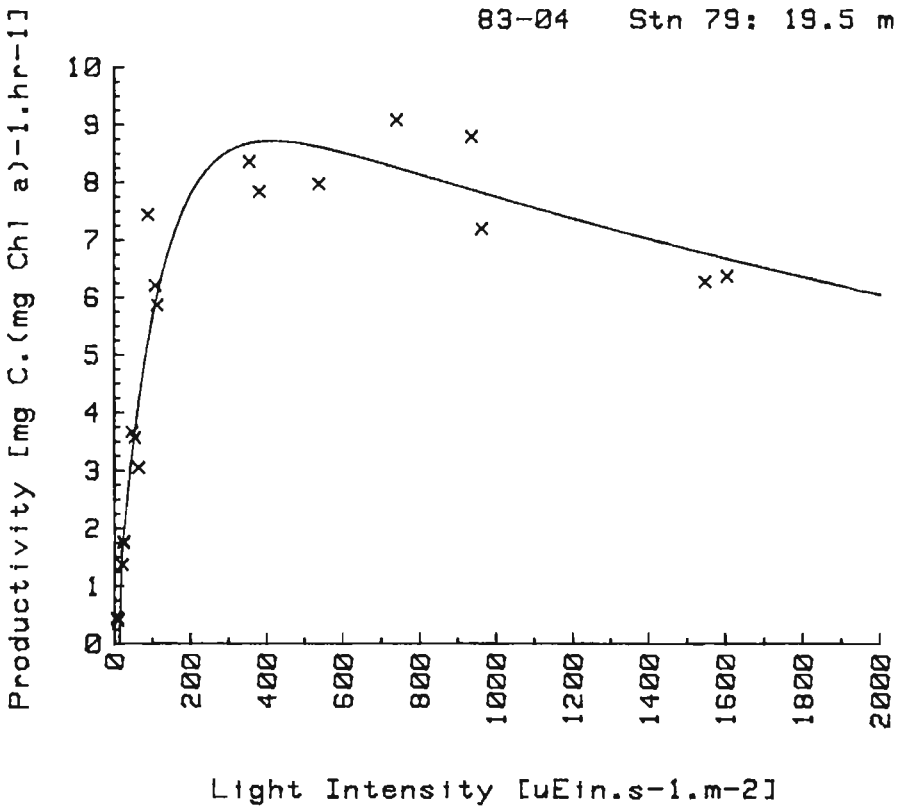
Psb	=	9.940	+/-	1.602
Alpha	=	.086	+/-	.015
Beta	=	.0025	+/-	.0020

Derived parameters:

Pm	=	8.72
Im	=	411.6
Is	=	115.0
Ib	=	4.01E+03

n = 20

r = .967 with 16 degrees of freedom


83-04 Stn 79: 19.5 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
9
10
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

Cruise : 83-04	Date:	83.07.06	Depth:	14.0	m
Station: 92	Time:	0759 (LAT)	Chlorophyll a:	4.29	mg.m-3
		0939 (PDT)	Dis. Inorg. C:	2.50E+04	mg.m-3

Final estimates +/- 90% confidence limits:

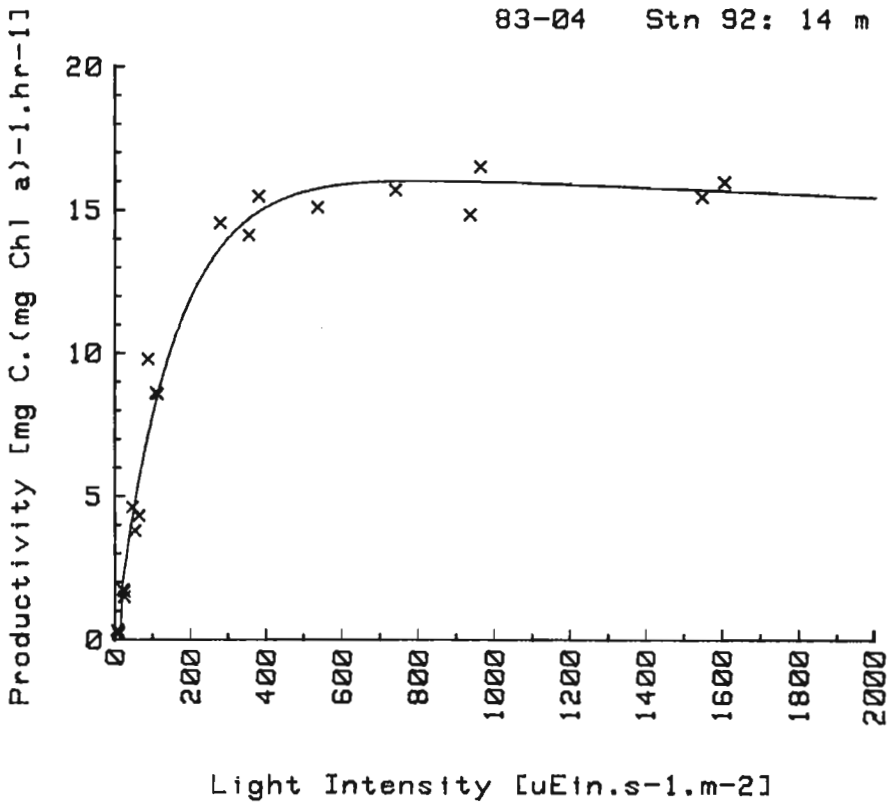
Psb	=	16.577	+/-	2.054
Alpha	=	.107	+/-	.015
Beta	=	.0006	+/-	.0019

Derived parameters:

Pm	=	16.01
Im	=	804.4
Is	=	155.1
Ib	=	2.76E+04

n = 21

r = .988 with 17 degrees of freedom


83-04 Stn 92: 14 m
Productivity [mg C.(mg Chl a)-1.hr-1]
20
15
10
5
0
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-04        Date:  83.07.06              Depth: 29.5       m
Station: 94           Time:  1405 (LAT)    Chlorophyll a:  6.52      mg.m-3
                             1545 (PDT)    Dis. Inorg. C:  2.47E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   11.386   +/-   1.472
              Alpha =     .091   +/-    .012
              Beta  =     .0000  +/-    .0019


          Derived parameters:
                 Pm =   11.37
                 Im = 1140.6
                 Is =  125.1
                 Ib =    1.14E+06

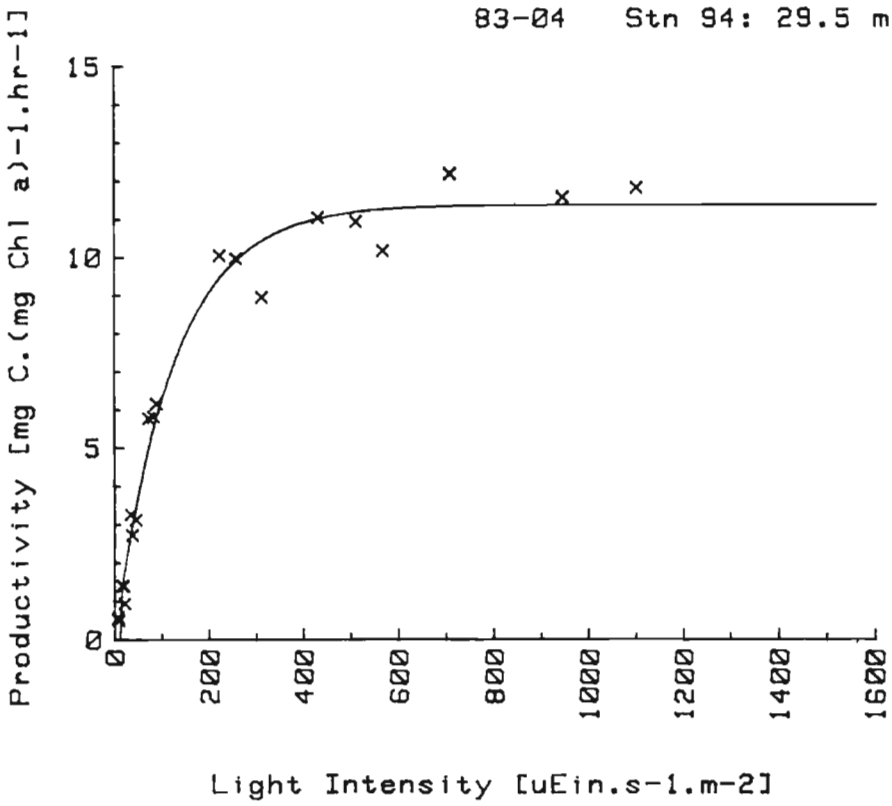

                 n =   21
                 r =     .990 with 17 degrees of freedom
```

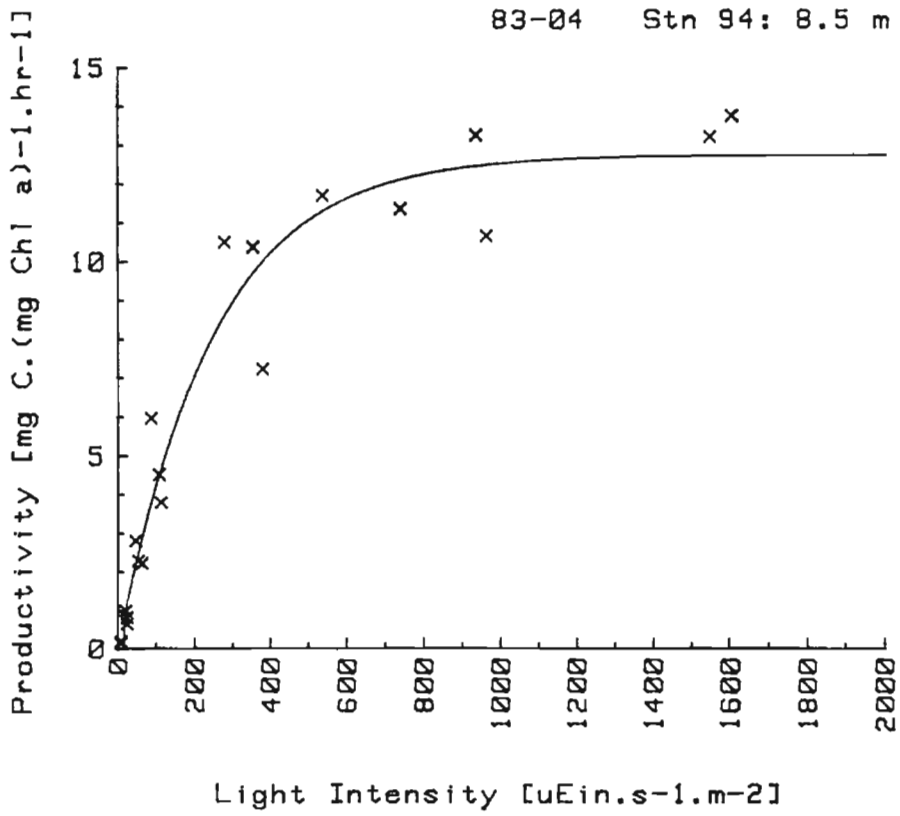
```
Cruise : 83-04        Date:  83.07.06              Depth:  8.5       m
Station: 94           Time:  1407 (LAT)    Chlorophyll a:  3.07      mg.m-3
                             1547 (PDT)    Dis. Inorg. C:  2.47E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   12.762   +/-   4.132
              Alpha =     .052   +/-    .013
              Beta  =     .0000  +/-    .0031


          Derived parameters:
                 Pm =   12.74
                 Im = 2114.6
                 Is =  247.4
                 Ib =    1.28E+06


                 n =   21
                 r =     .973 with 17 degrees of freedom
```


83-04 Stn 94: 29.5 m
Productivity [mg C.(mg Chl a)-1.hr-1]
15
10
5
0
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]


83-04 Stn 94: 8.5 m
Productivity [mg C.(mg Chl a)-1.hr-1]
15
10
5
0
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-04        Date:  83.07.06              Depth: 19.6       m
Station: 96 A         Time:  1909 (LAT)    Chlorophyll a: 16.19      mg.m-3
                             2050 (PDT)    Dis. Inorg. C:  2.48E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    7.557   +/-    .987
              Alpha =     .061   +/-    .010
              Beta  =     .0004  +/-    .0010


          Derived parameters:
                 Pm =    7.27
                 Im =  626.6
                 Is =  123.7
                 Ib =    1.95E+04

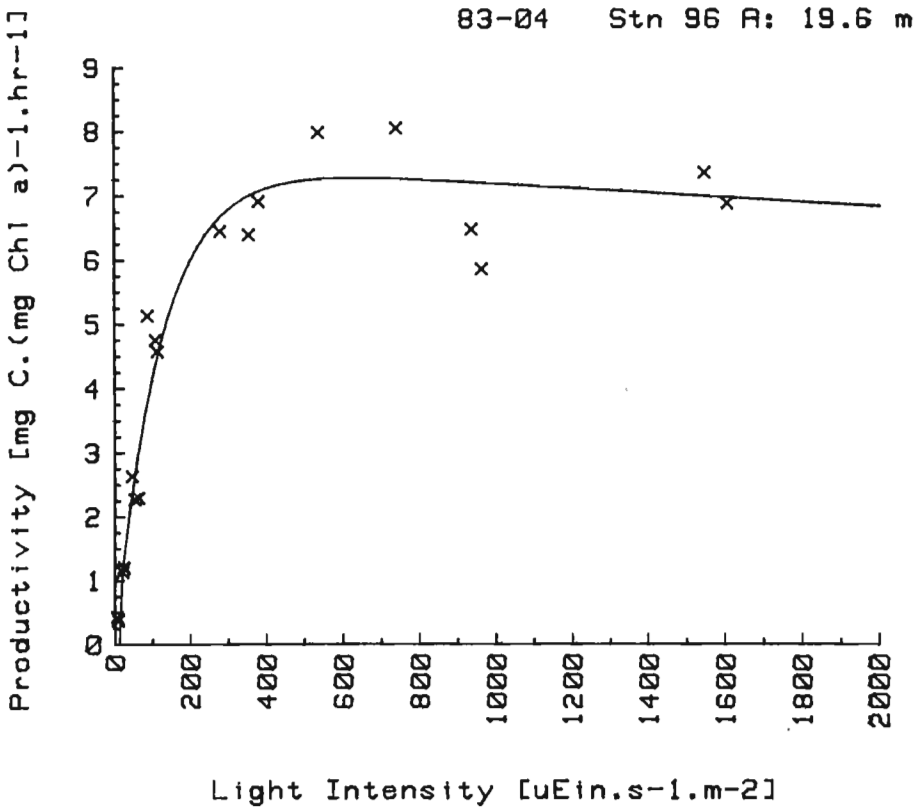

                 n =   21
                 r =     .979 with 17 degrees of freedom
```

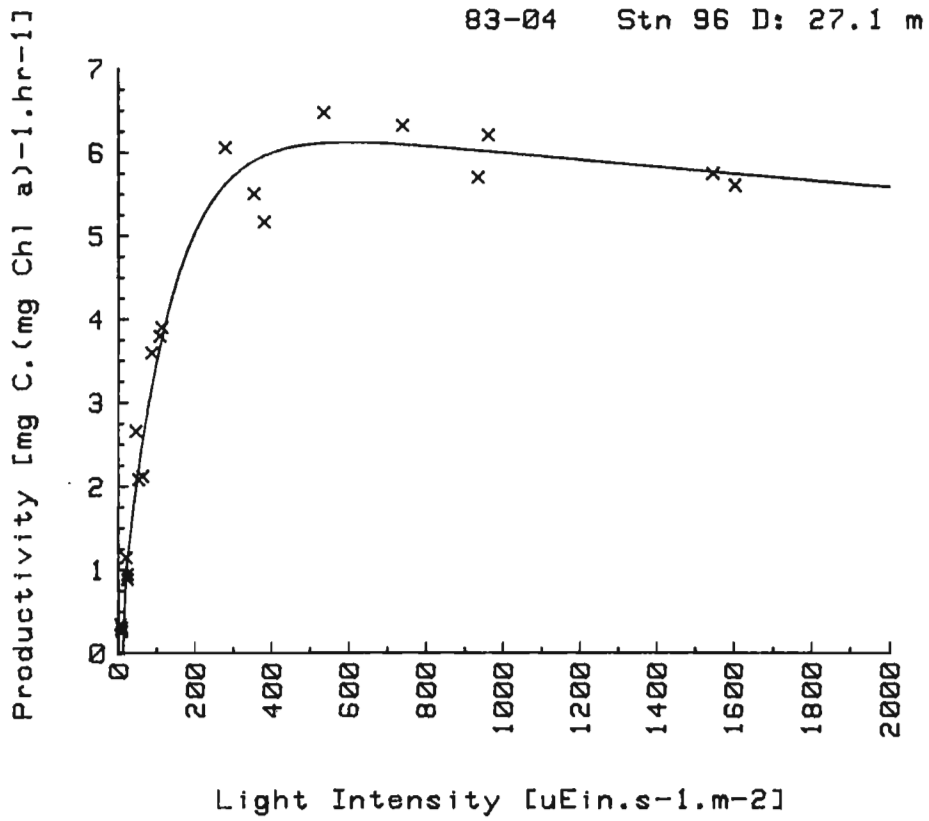
```
Cruise : 83-04        Date:  83.07.06              Depth: 27.1       m
Station: 96 D         Time:  2211 (LAT)    Chlorophyll a:  5.71      mg.m-3
                             2351 (PDT)    Dis. Inorg. C:  2.46E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    6.448   +/-    .661
              Alpha =     .051   +/-    .006
              Beta  =     .0005  +/-    .0007


          Derived parameters:
                 Pm =    6.12
                 Im =  595.4
                 Is =  126.9
                 Ib =    1.37E+04


                 n =   21
                 r =     .987 with 17 degrees of freedom
```


83-04 Stn 96 A: 19.6 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
9
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]


83-04 Stn 96 D: 27.1 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-04        Date:  83.07.07              Depth: 30.1       m
Station: 96 G         Time:  0109 (LAT)    Chlorophyll a:  5.53      mg.m-3
                             0249 (PDT)    Dis. Inorg. C:  2.50E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    4.426   +/-    .710
              Alpha =     .030   +/-    .005
              Beta  =     .0008  +/-    .0008


          Derived parameters:
                 Pm =    3.93
                 Im =  541.6
                 Is =  146.2
                 Ib =    5.79E+03

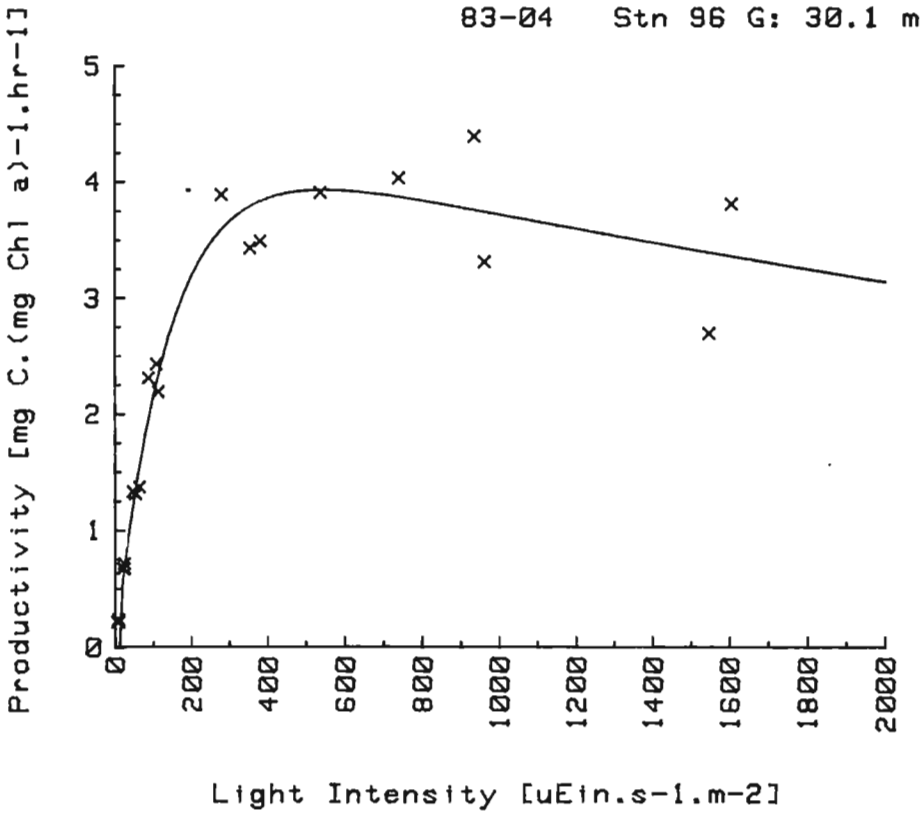

                 n =   21
                 r =     .975 with 17 degrees of freedom
```

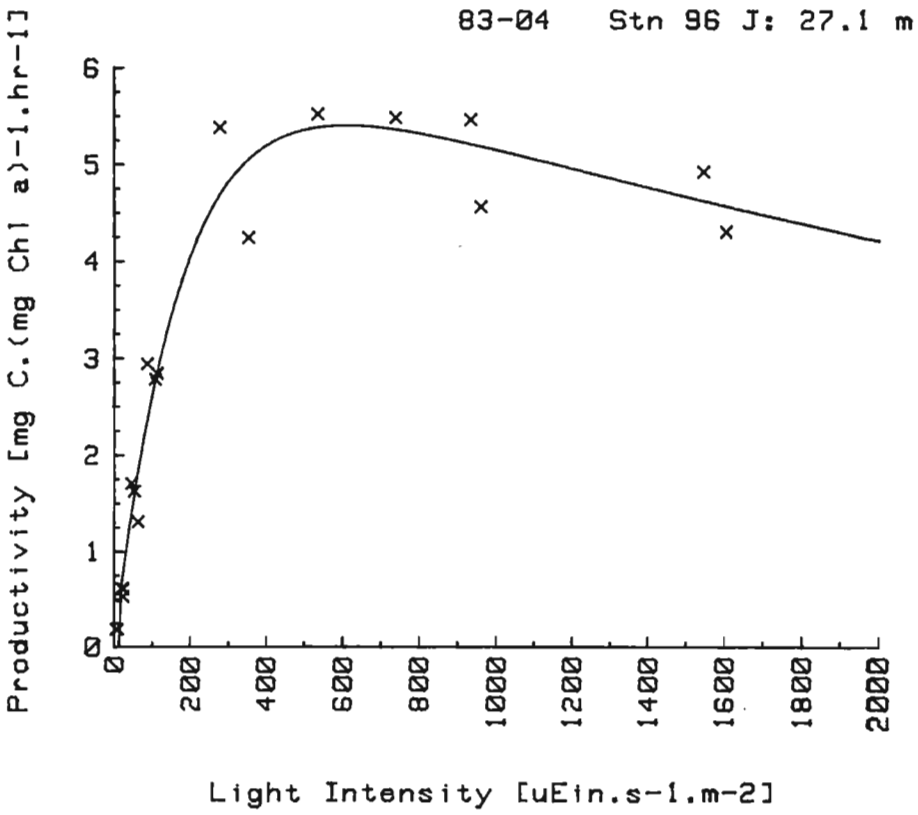
```
Cruise : 83-04        Date:  83.07.07              Depth: 27.1       m
Station: 96 J         Time:  0409 (LAT)    Chlorophyll a: 13.93      mg.m-3
                             0549 (PDT)    Dis. Inorg. C:  2.60E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    6.357   +/-   1.221
              Alpha =     .035   +/-    .005
              Beta  =     .0013  +/-    .0013


          Derived parameters:
                 Pm =    5.40
                 Im =  608.4
                 Is =  183.7
                 Ib =    4.86E+03


                 n =   20
                 r =     .981 with 16 degrees of freedom
```


83-04 Stn 96 G: 30.1 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]


83-04 Stn 96 J: 27.1 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-04        Date:  83.07.07              Depth: 28.7       m
Station: 96 M         Time:  0711 (LAT)    Chlorophyll a: 14.43      mg.m-3
                             0851 (PDT)    Dis. Inorg. C:  2.57E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    8.619   +/-   1.004
              Alpha =     .053   +/-    .005
              Beta  =     .0037  +/-    .0014


          Derived parameters:
                 Pm =    6.66
                 Im =  446.8
                 Is =  163.5
                 Ib =    2.35E+03

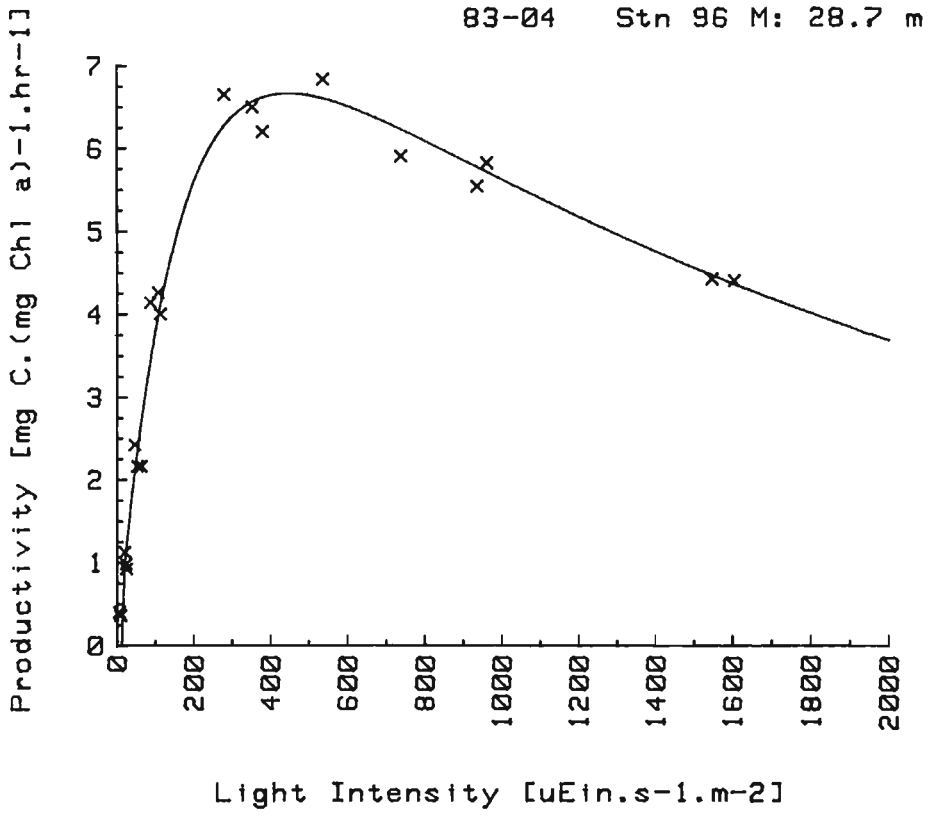

                 n =   21
                 r =     .990 with 17 degrees of freedom
```

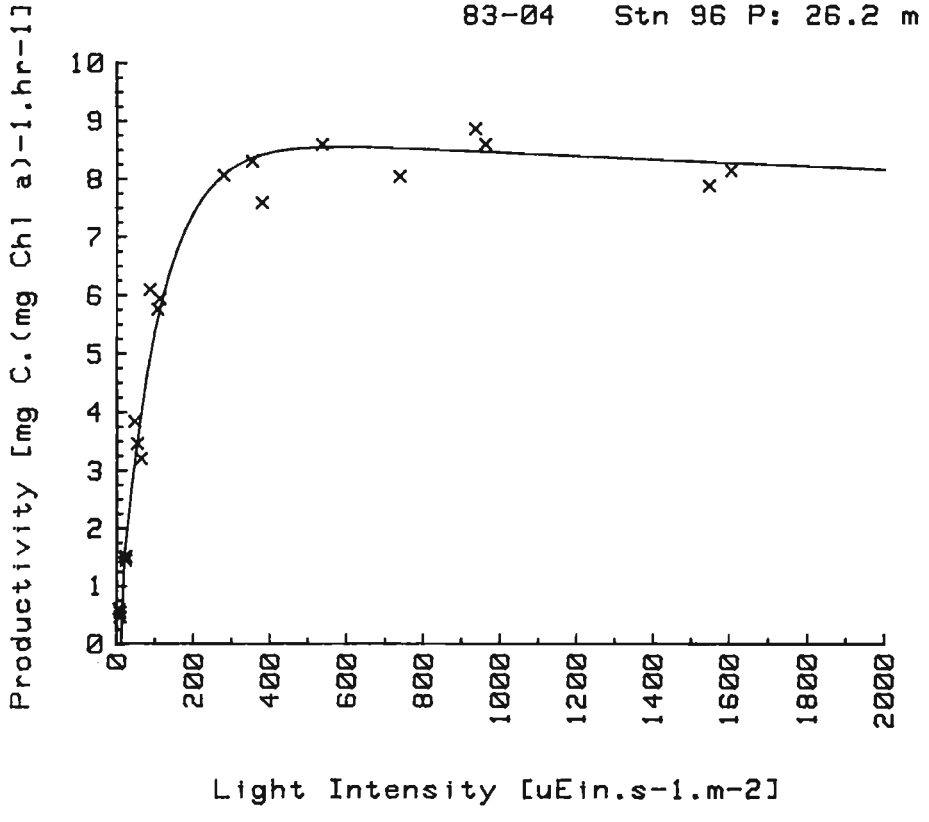
```
Cruise : 83-04        Date:  83.07.07              Depth: 26.2       m
Station: 96 P         Time:  1011 (LAT)    Chlorophyll a:  8.46      mg.m-3
                             1151 (PDT)    Dis. Inorg. C:  2.57E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    8.771   +/-    .799
              Alpha =     .083   +/-    .010
              Beta  =     .0003  +/-    .0008


          Derived parameters:
                 Pm =    8.55
                 Im =  586.3
                 Is =  105.4
                 Ib =    2.73E+04


                 n =   21
                 r =     .987 with 17 degrees of freedom
```


83-04 Stn 96 M: 28.7 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]


83-04 Stn 96 P: 26.2 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
9
10
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-04        Date:  83.07.07              Depth: 25.4       m
Station: 96 S         Time:  1310 (LAT)    Chlorophyll a: 15.49      mg.m-3
                             1450 (PDT)    Dis. Inorg. C:  2.50E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    6.402   +/-    .824
              Alpha =     .060   +/-    .010
              Beta  =     .0009  +/-    .0009

          Derived parameters:
                 Pm =    5.93
                 Im =  455.0
                 Is =  107.6
                 Ib =    7.28E+03

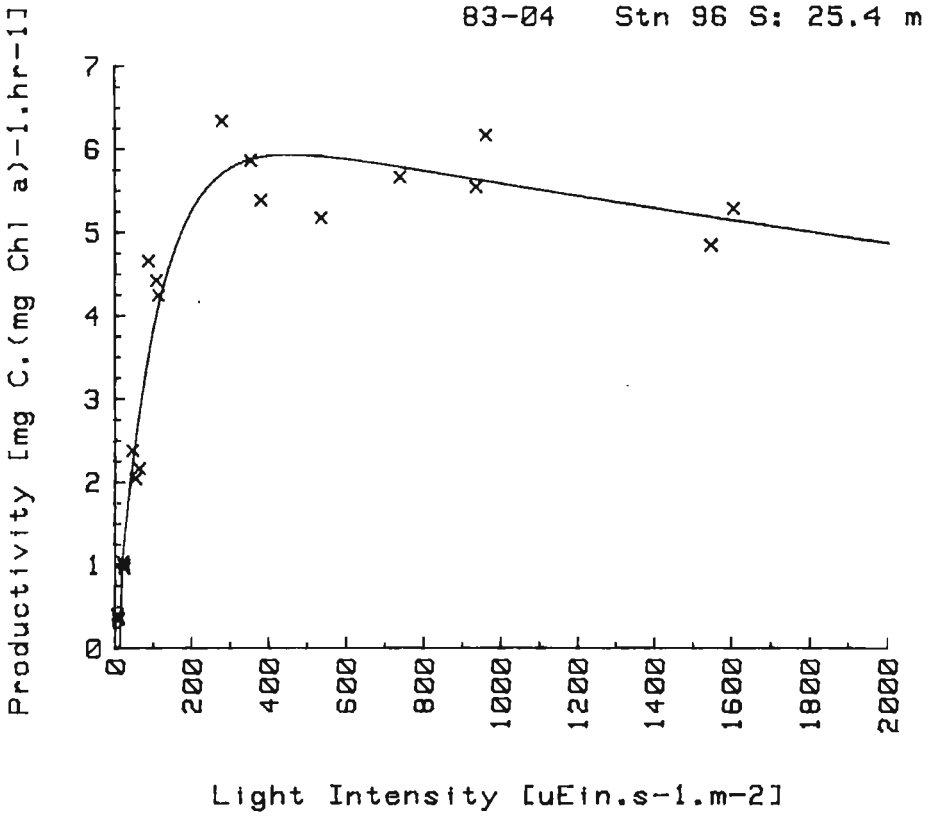
                  n =   21
                  r =     .974 with 17 degrees of freedom
```

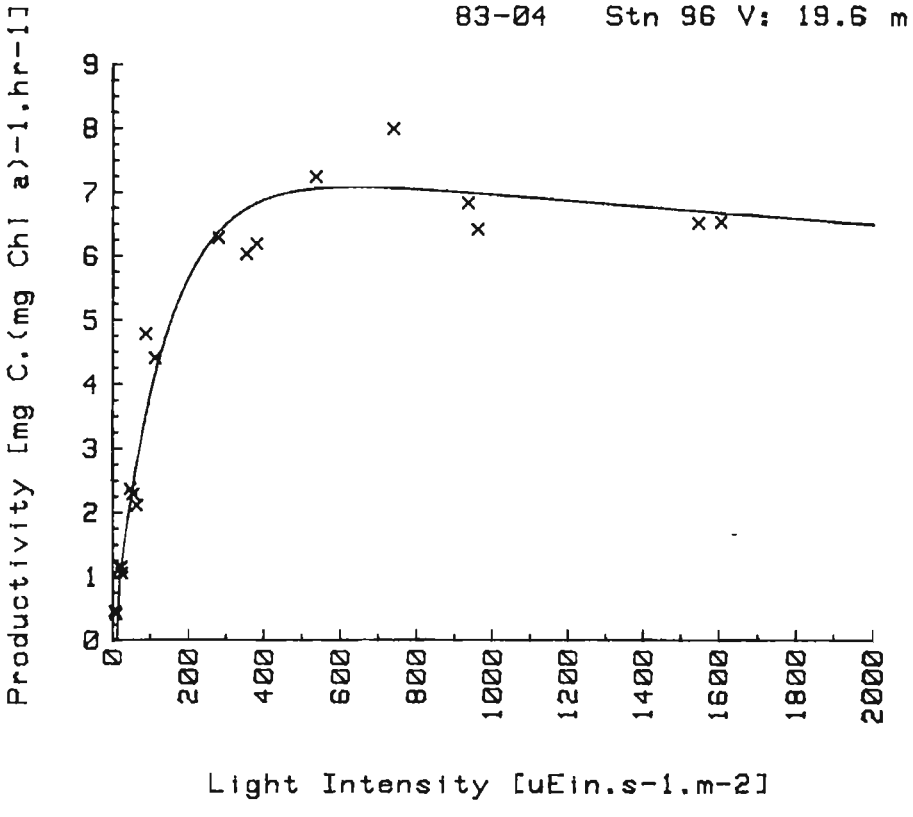
```
Cruise : 83-04        Date:  83.07.07              Depth: 19.6       m
Station: 96 V         Time:  1610 (LAT)    Chlorophyll a: 11.40      mg.m-3
                             1750 (PDT)    Dis. Inorg. C:  2.50E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    7.483   +/-    .951
              Alpha =     .054   +/-    .009
              Beta  =     .0005  +/-    .0010

          Derived parameters:
                 Pm =    7.08
                 Im =  636.0
                 Is =  137.5
                 Ib =    1.39E+04

                  n =   20
                  r =     .984 with 16 degrees of freedom
```


83-04 Stn 96 S: 25.4 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]


83-04 Stn 96 V: 19.6 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
9
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

Cruise : 83-04	Date:	83.07.07	Depth: 22.1	m
Station: 96 Y	Time:	1912 (LAT)	Chlorophyll a: 12.59	mg.m-3
		2052 (PDT)	Dis. Inorg. C: 2.51E+04	mg.m-3

Final estimates +/- 90% confidence limits:

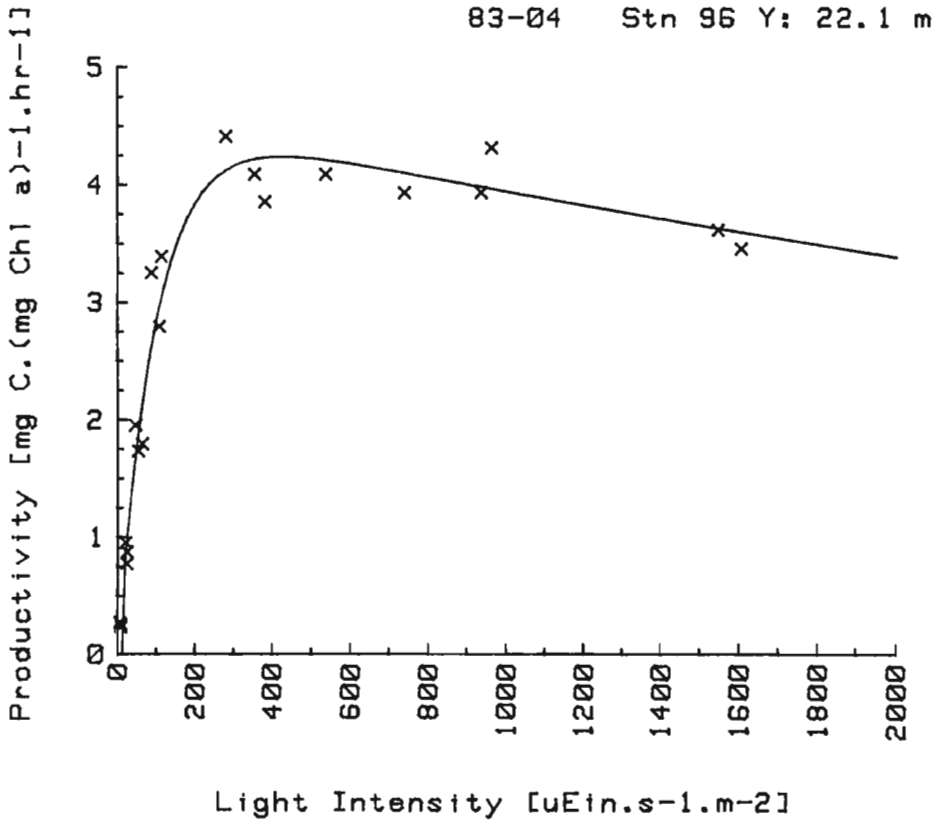
Psb	=	4.591	+/-	.452
Alpha	=	.045	+/-	.006
Beta	=	.0007	+/-	.0005

Derived parameters:

Pm	=	4.24
Im	=	422.7
Is	=	101.0
Ib	=	6.54E+03

n = 21

r = .983 with 17 degrees of freedom


83-04 Stn 96 Y: 22.1 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-04        Date:  83.07.07              Depth:  9.3       m
Station: 101          Time:  2211 (LAT)    Chlorophyll a:  1.87      mg.m-3
                             2352 (PDT)    Dis. Inorg. C:  2.46E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    3.650   +/-    .463
              Alpha =     .035   +/-    .006
              Beta  =     .0000  +/-    .0005


          Derived parameters:
                 Pm =    3.64
                 Im =  848.5
                 Is =  103.9
                 Ib =    3.65E+05

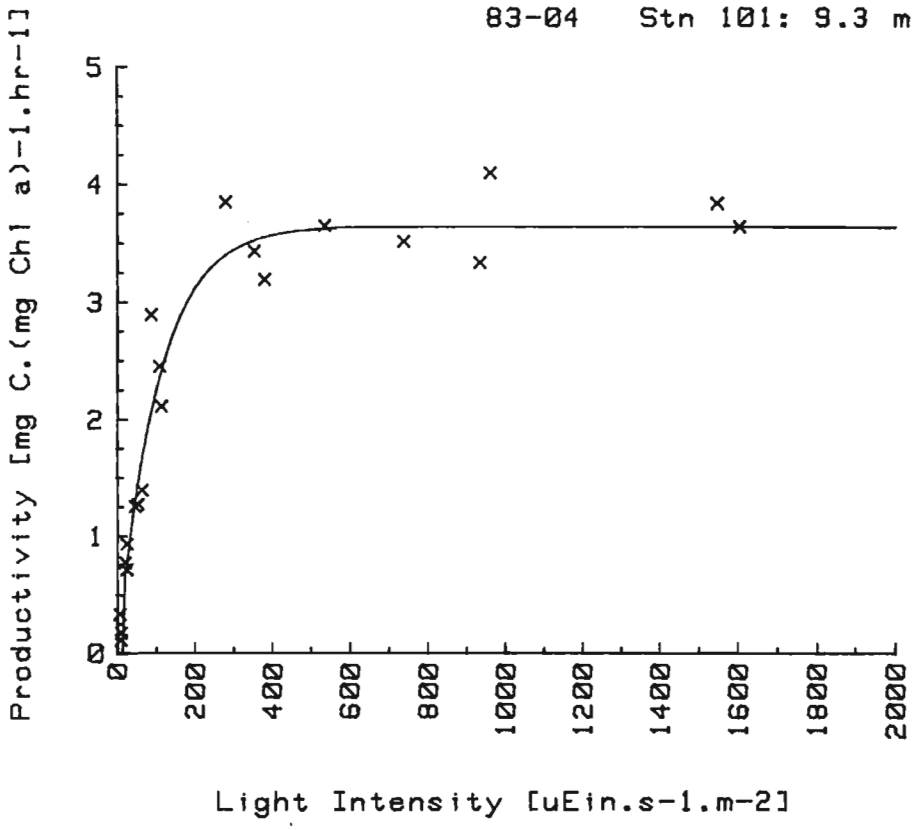

                 n =   21
                 r =     .975 with 17 degrees of freedom
```

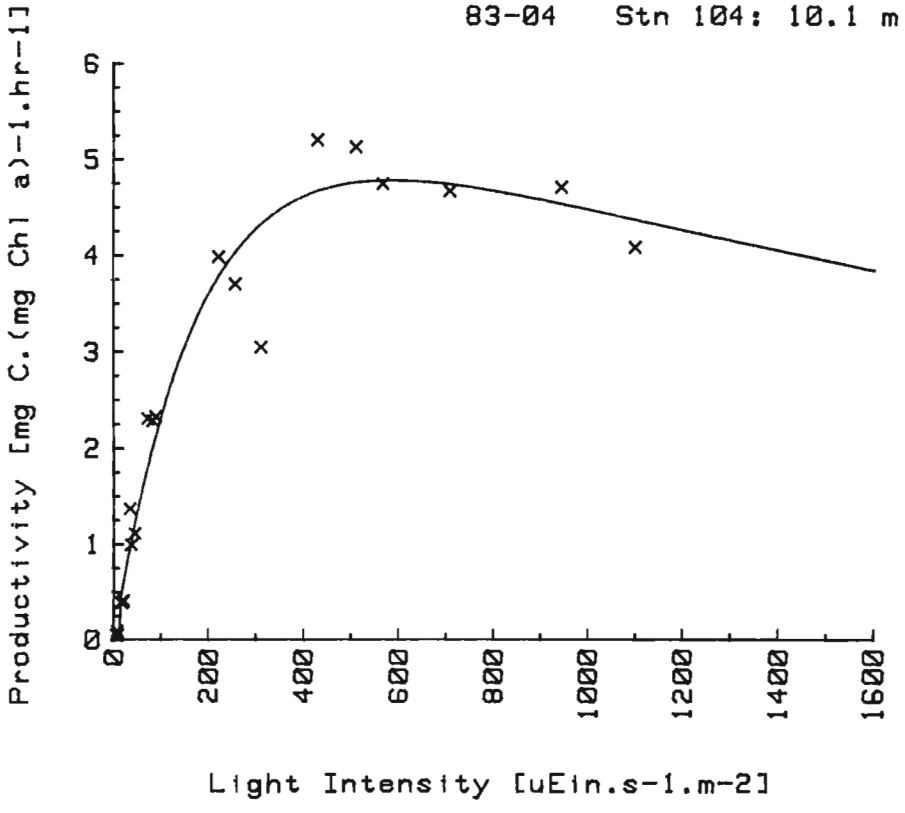
```
Cruise : 83-04        Date:  83.07.08              Depth: 10.1       m
Station: 104          Time:  0106 (LAT)    Chlorophyll a:  1.27      mg.m-3
                             0247 (PDT)    Dis. Inorg. C:  2.42E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    5.862   +/-   2.222
              Alpha =     .030   +/-    .006
              Beta  =     .0015  +/-    .0031


          Derived parameters:
                 Pm =    4.78
                 Im =  583.6
                 Is =  192.8
                 Ib =    3.79E+03


                 n =   21
                 r =     .976 with 17 degrees of freedom
```


83-04 Stn 101: 9.3 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]


83-04 Stn 104: 10.1 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-04        Date:  83.07.08              Depth: 10.2       m
Station: 107          Time:  0414 (LAT)    Chlorophyll a:  4.44      mg.m-3
                             0555 (PDT)    Dis. Inorg. C:  2.47E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    6.866   +/-    .845
              Alpha =     .058   +/-    .007
              Beta  =     .0000  +/-    .0011


          Derived parameters:
                 Pm =    6.84
                 Im =  934.6
                 Is =  118.4
                 Ib =    3.17E+05

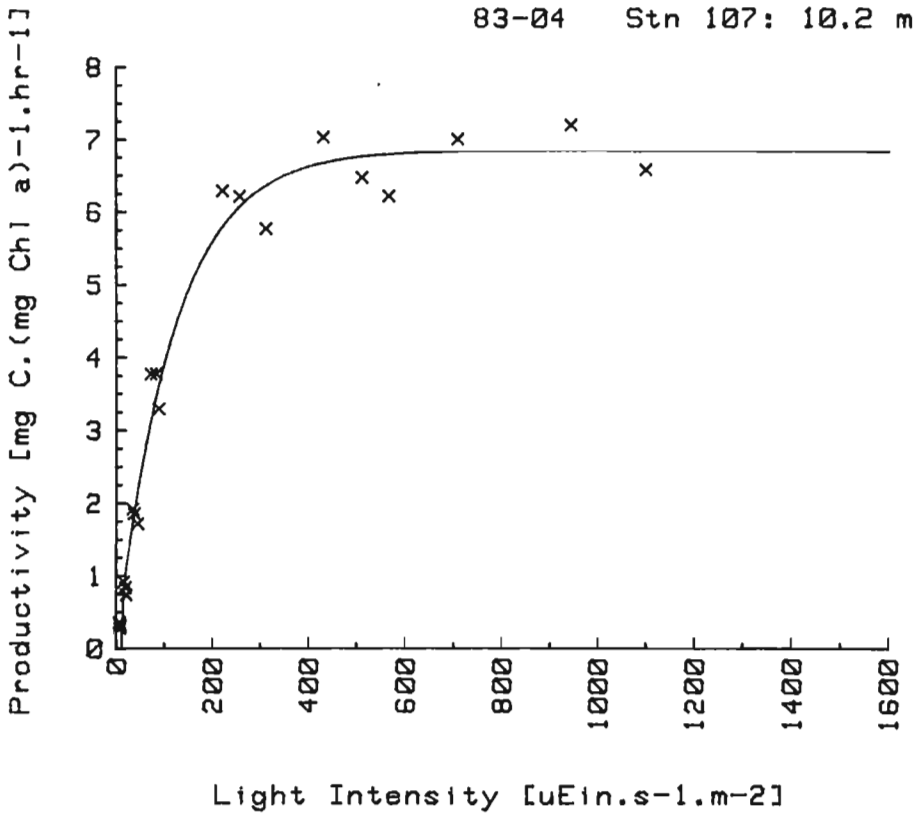

                 n =   21
                 r =     .990 with 17 degrees of freedom
```

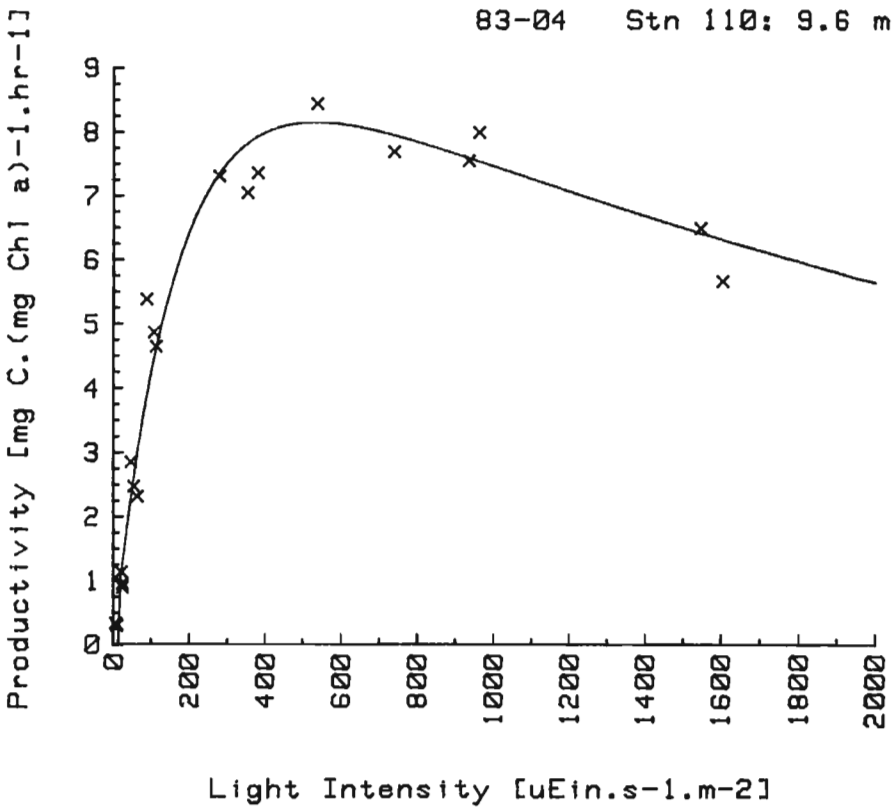
```
Cruise : 83-04        Date:  83.07.08              Depth:  9.6       m
Station: 110          Time:  0709 (LAT)    Chlorophyll a:  5.86      mg.m-3
                             0850 (PDT)    Dis. Inorg. C:  2.47E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    9.934   +/-   1.721
              Alpha =     .057   +/-    .008
              Beta  =     .0028  +/-    .0021


          Derived parameters:
                 Pm =    8.15
                 Im =  530.6
                 Is =  173.2
                 Ib =    3.54E+03


                 n =   21
                 r =     .981 with 17 degrees of freedom
```


83-04 Stn 107: 10.2 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]


83-04 Stn 110: 9.6 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
9
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-04        Date:  83.07.08              Depth:  9.0       m
Station: 113          Time:  1015 (LAT)    Chlorophyll a:  1.29      mg.m-3
                             1156 (PDT)    Dis. Inorg. C:  2.46E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   14.258   +/-   4.305
              Alpha =     .075   +/-    .018
              Beta  =     .0037  +/-    .0049


          Derived parameters:
                 Pm =   11.68
                 Im =  582.0
                 Is =  190.7
                 Ib =    3.85E+03

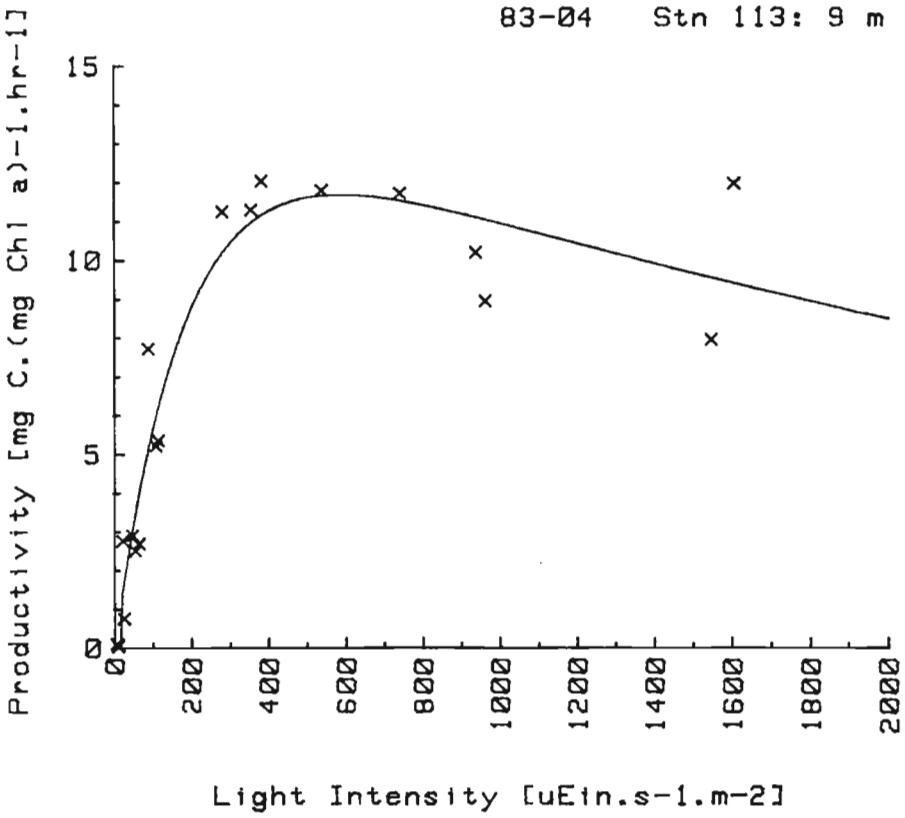

                 n =   21
                 r =     .958 with 17 degrees of freedom
```

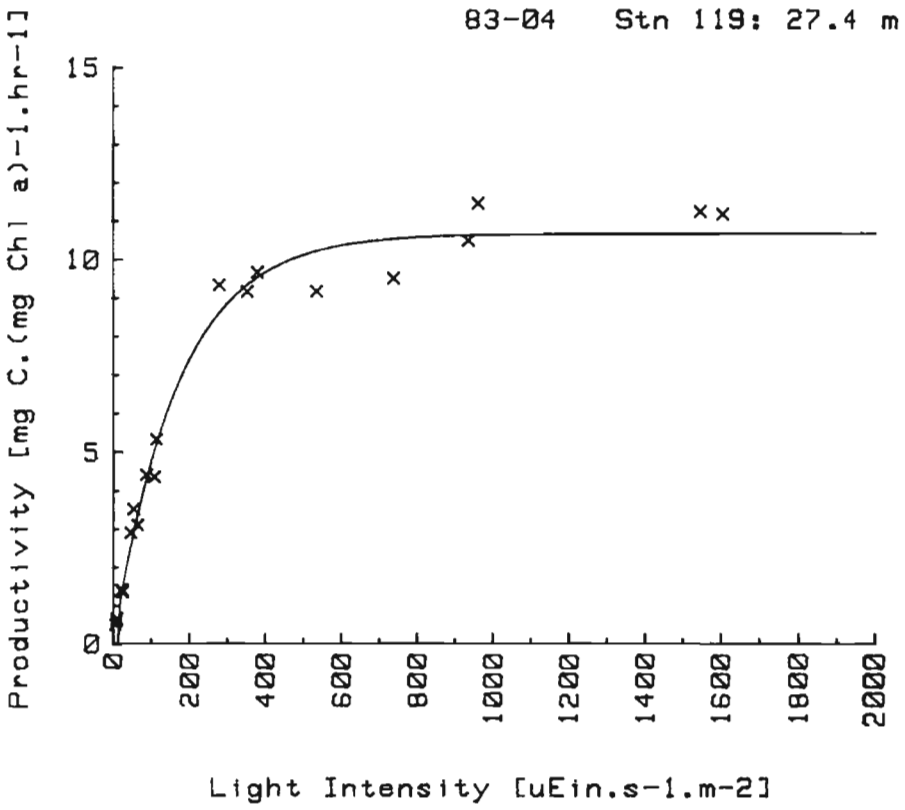
```
Cruise : 83-04        Date:  83.07.08              Depth: 27.4       m
Station: 119          Time:  1609 (LAT)    Chlorophyll a:  6.37      mg.m-3
                             1750 (PDT)    Dis. Inorg. C:  2.44E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =   10.685   +/-   1.174
              Alpha =     .063   +/-    .007
              Beta  =     .0000  +/-    .0010


          Derived parameters:
                 Pm =   10.67
                 Im = 1487.8
                 Is =  170.1
                 Ib =    1.07E+06


                 n =   21
                 r =     .992 with 17 degrees of freedom
```


83-04 Stn 113: 9 m
Productivity [mg C.(mg Chl a)-1.hr-1]
15
10
5
0
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]


83-04 Stn 119: 27.4 m
Productivity [mg C.(mg Chl a)-1.hr-1]
15
10
5
0
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-04        Date:  83.07.08              Depth:  8.8       m
Station: 122          Time:  1911 (LAT)    Chlorophyll a:   .65      mg.m-3
                             2052 (PDT)    Dis. Inorg. C:  2.48E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    7.339   +/-   2.787
              Alpha =     .028   +/-    .007
              Beta  =     .0000  +/-    .0020


          Derived parameters:
                 Pm =    7.34
                 Im = 3664.5
                 Is =  257.9
                 Ib =    3.82E+08

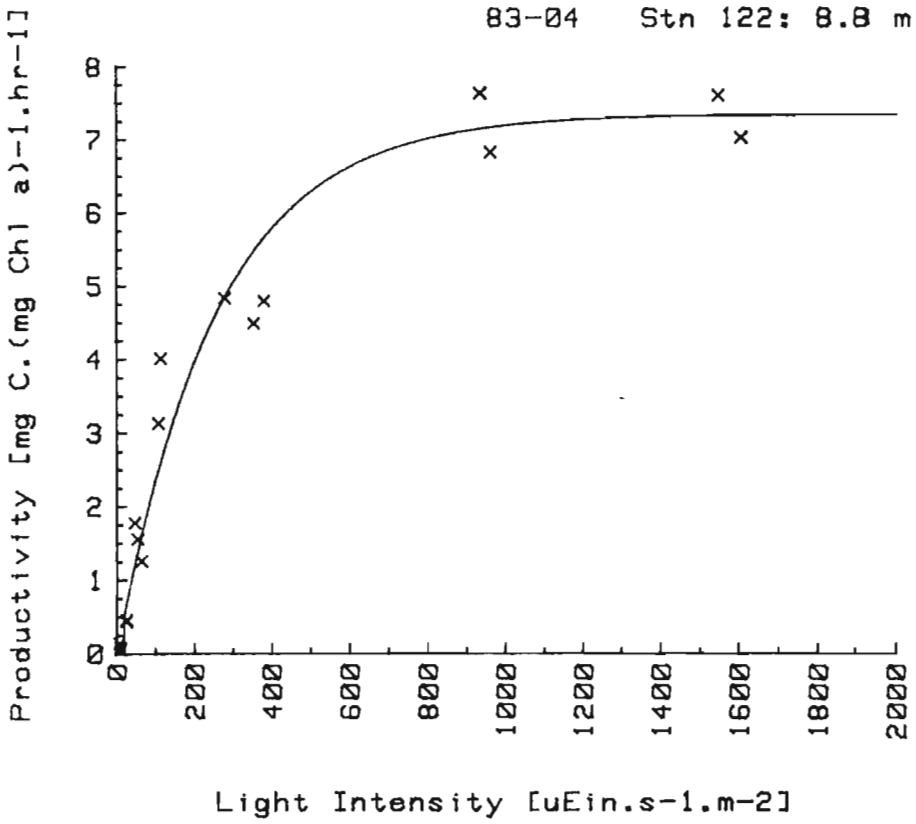

                 n =   17
                 r =     .977 with 13 degrees of freedom
```

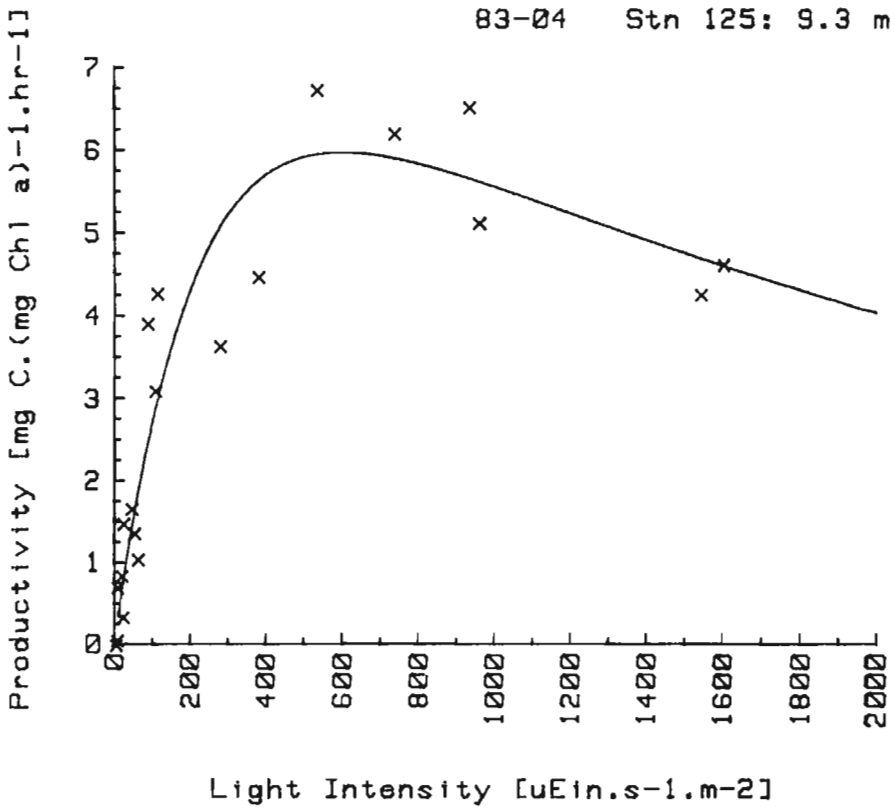
```
Cruise : 83-04        Date:  83.07.08              Depth:  9.3       m
Station: 125          Time:  2211 (LAT)    Chlorophyll a:   .99      mg.m-3
                             2352 (PDT)    Dis. Inorg. C:  2.48E+04 mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    7.825   +/-   3.592
              Alpha =     .035   +/-    .010
              Beta  =     .0026  +/-    .0042


          Derived parameters:
                 Pm =    5.97
                 Im =  600.1
                 Is =  225.0
                 Ib =    3.01E+03


                 n =   20
                 r =     .935 with 16 degrees of freedom
```


83-04 Stn 122: 8.8 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]


83-04 Stn 125: 9.3 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

```
Cruise : 83-04        Date:  83.07.09              Depth: 20.4       m
Station: 129          Time:  0016 (LAT)    Chlorophyll a:  6.49      mg.m-3
                             0157 (PDT)    Dis. Inorg. C:  2.49E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    7.390   +/-   1.526
              Alpha =     .049   +/-    .008
              Beta  =     .0023  +/-    .0020


          Derived parameters:
                 Pm =    6.11
                 Im =  467.1
                 Is =  150.0
                 Ib =    3.23E+03

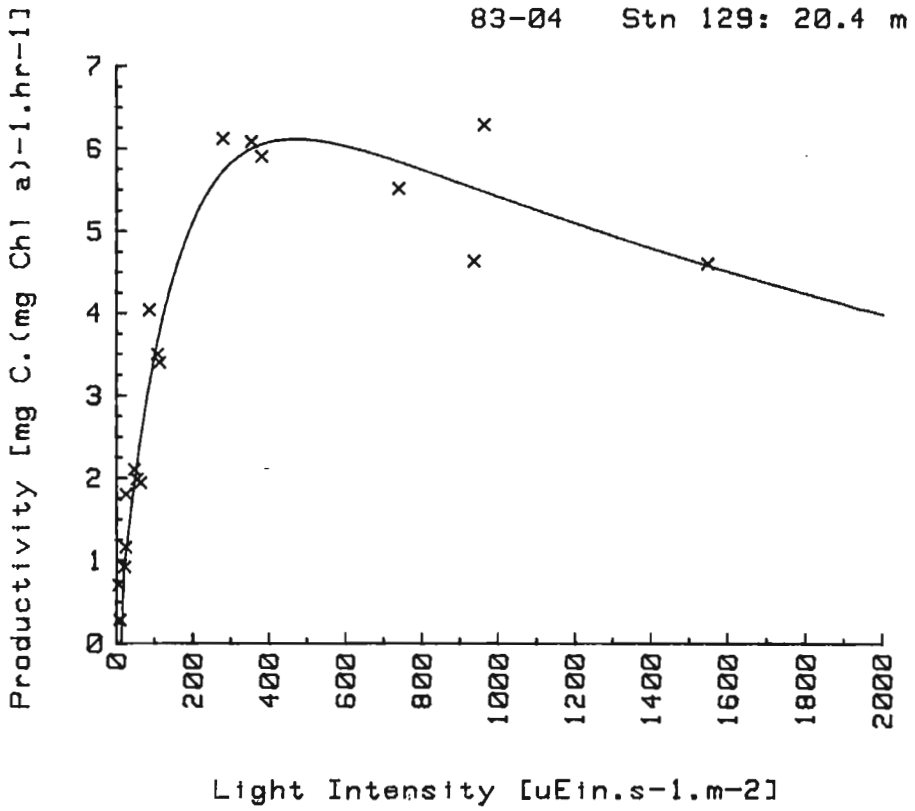

                 n =   19
                 r =     .975 with 15 degrees of freedom
```

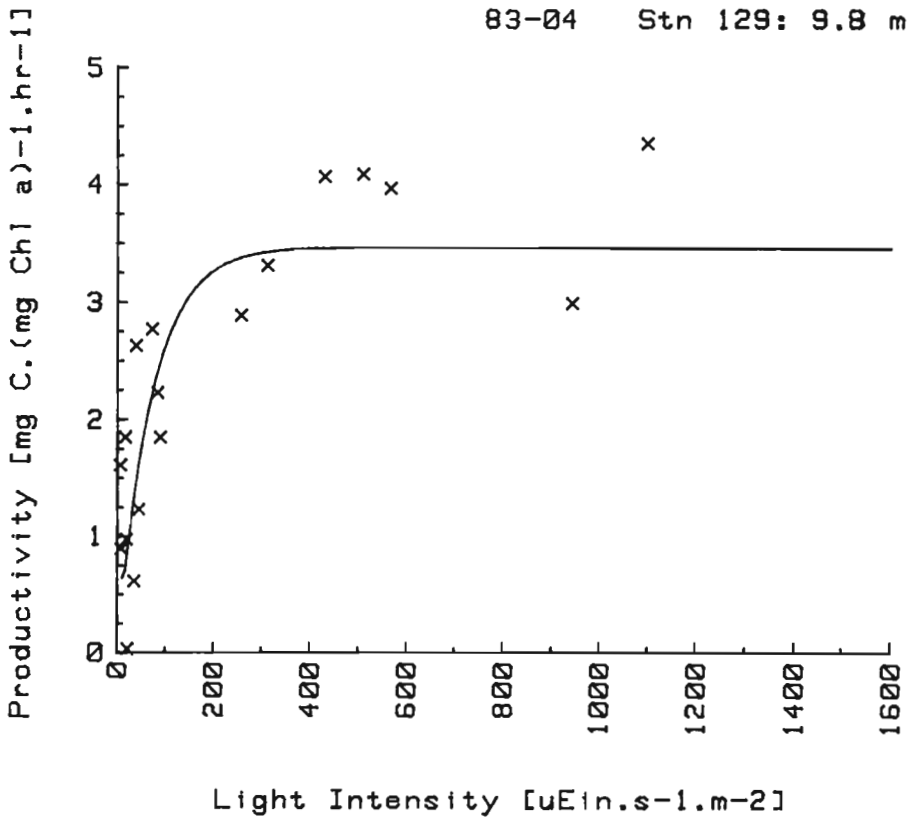
```
Cruise : 83-04        Date:  83.07.09              Depth:  9.8       m
Station: 129          Time:  0017 (LAT)    Chlorophyll a:  1.05      mg.m-3
                             0158 (PDT)    Dis. Inorg. C:  2.46E+04  mg.m-3


          Final estimates +/- 90% confidence limits:
              Psb   =    3.473   +/-   1.271
              Alpha =     .049   +/-    .023
              Beta  =     .0000  +/-    .0019


          Derived parameters:
                 Pm =    3.47
                 Im =  598.1
                 Is =   70.3
                 Ib =    3.47E+05


                 n =   18
                 r =     .807 with 14 degrees of freedom
```


83-04 Stn 129: 20.4 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]


83-04 Stn 129: 9.8 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
0
200
400
600
800
1000
1200
1400
1600
Light Intensity [uEin.s-1.m-2]

Cruise : 83-04	Date:	83.07.09	Depth:	25.1	m
Station: 131	Time:	0413 (LAT)	Chlorophyll a:	6.45	mg.m-3
		.554 (PDT)	Dis. Inorg. C:	2.47E+04	mg.m-3

Final estimates +/- 90% confidence limits:

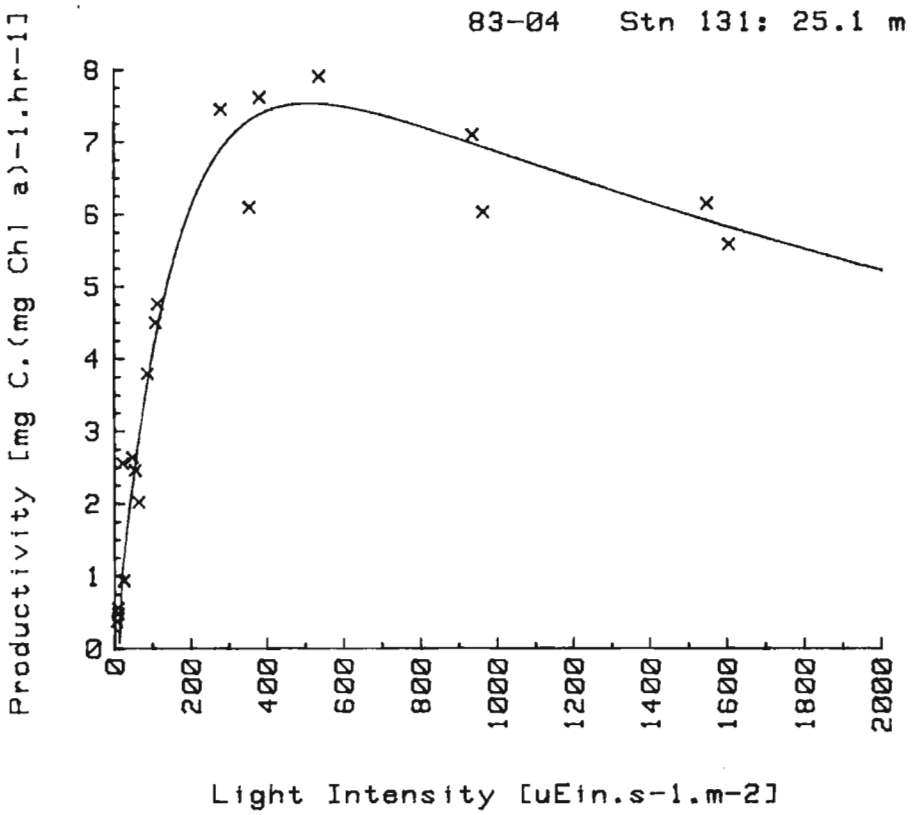
Psb	=	9.051	+/-	1.629
Alpha	=	.056	+/-	.009
Beta	=	.0025	+/-	.0019

Derived parameters:

Pm	=	7.53
Im	=	508.9
Is	=	161.3
Ib	=	3.62E+03

n = 20

r = .977 with 16 degrees of freedom

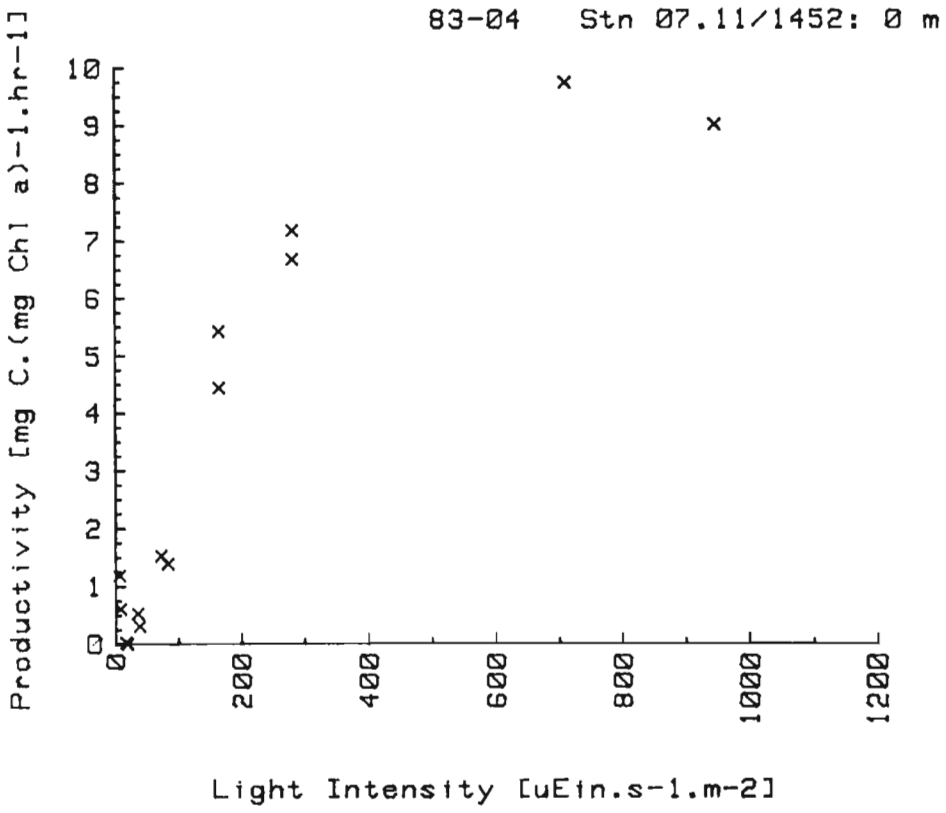

83-04 Stn 131: 25.1 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Light Intensity [uEin.s-1.m-2]

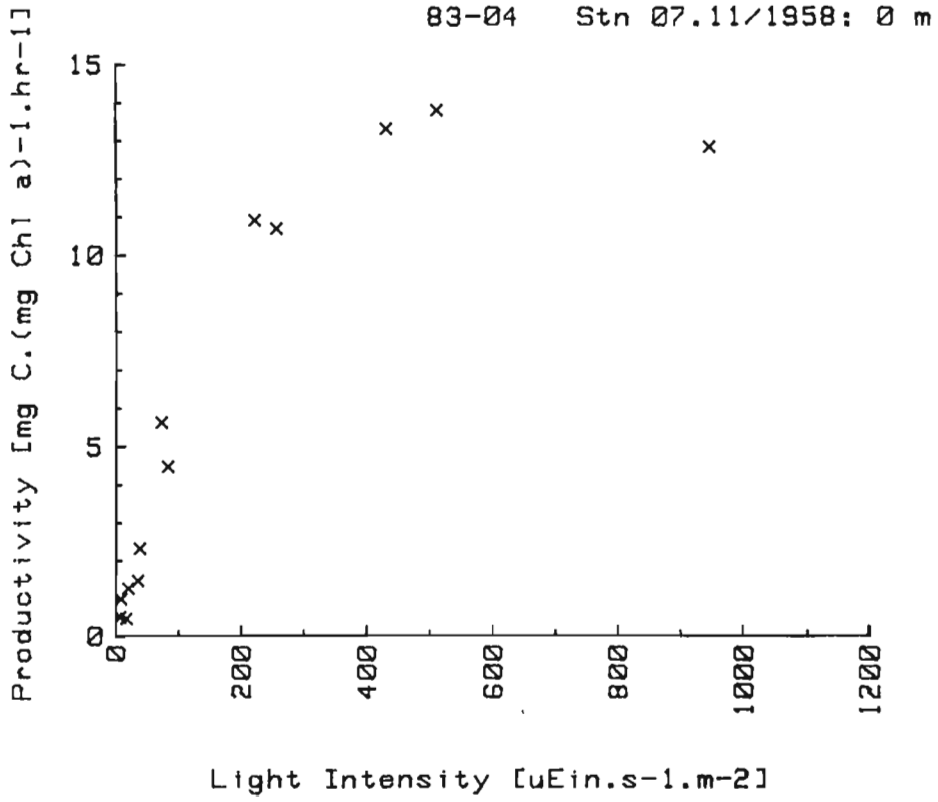
Cruise : 83-04	Date:	83.07.11	Depth:	0.0	m
Station: 07.11/1452	Time:	1311 (LAT)	Chlorophyll a:	.26	mg.m-3
		1452 (PDT)	Dis. Inorg. C:	2.48E+04	mg.m-3

Number of data points: 14

Cruise : 83-04	Date:	83.07.11	Depth:	0.0	m
Station: 07.11/1958	Time:	1817 (LAT)	Chlorophyll a:	.29	mg.m-3
		1958 (PDT)	Dis. Inorg. C:	2.48E+04	mg.m-3

Number of data points: 13


83-04 Stn 07.11/1452: 0 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
1
2
3
4
5
6
7
8
9
10
0
200
400
600
800
1000
1200
Light Intensity [uEin.s-1.m-2]

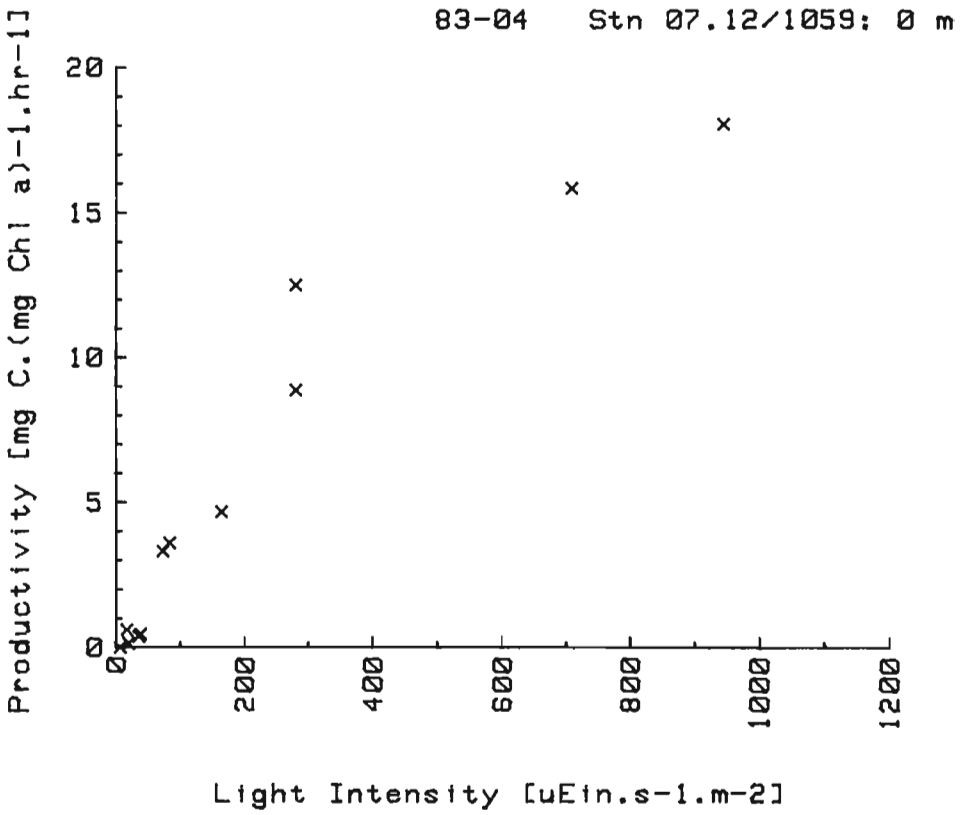

83-04 Stn 07.11/1958: 0 m
Productivity [mg C.(mg Chl a)-1.hr-1]
0
5
10
15
0
200
400
600
800
1000
1200
Light Intensity [uEin.s-1.m-2]

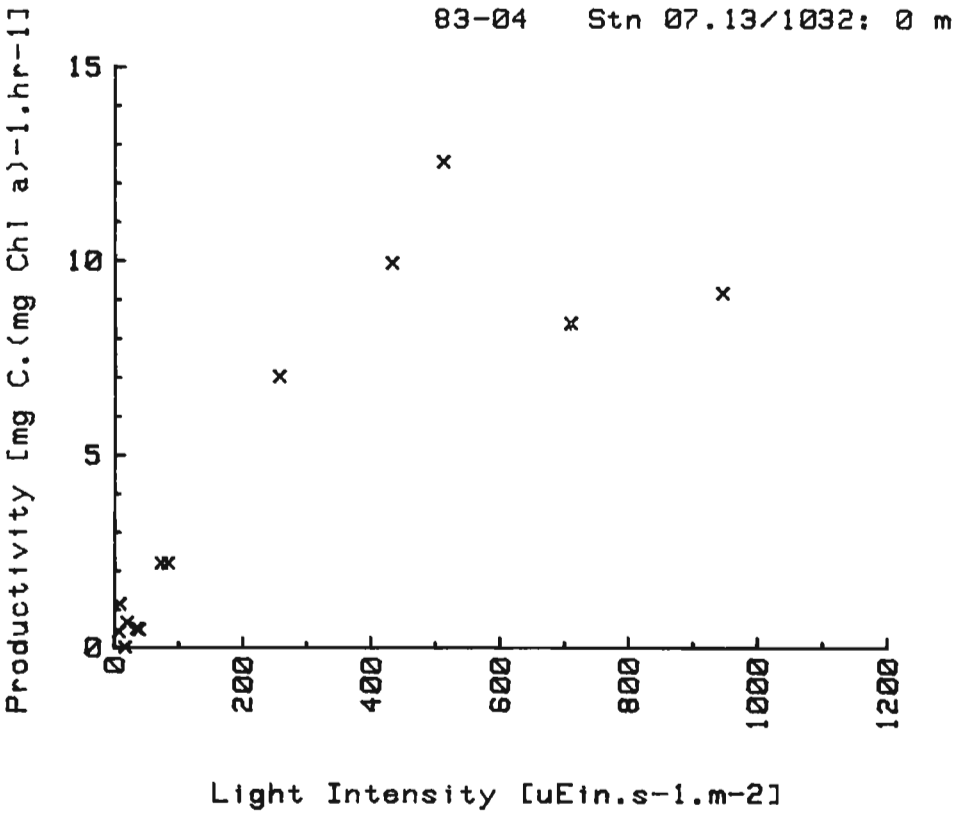
Cruise : 83-04	Date:	83.07.12		Depth:	0.0	m
Station: 07.12/1059	Time:	0918 (LAT)		Chlorophyll a:	.22	mg.m-3
		1059 (PDT)		Dis. Inorg. C:	2.50E+04	mg.m-3

Number of data points: 12

Cruise : 83-04	Date:	83.07.13		Depth:	0.0	m
Station: 07.13/1032	Time:	0851 (LAT)		Chlorophyll a:	.21	mg.m-3
		1032 (PDT)		Dis. Inorg. C:	2.49E+04	mg.m-3

Number of data points: 13


83-04 Stn 07.12/1059: 0 m
Productivity [mg C.(mg Chl a)-1.hr-1]
20
15
10
5
0
0
200
400
600
800
1000
1200
Light Intensity [uEin.s-1.m-2]

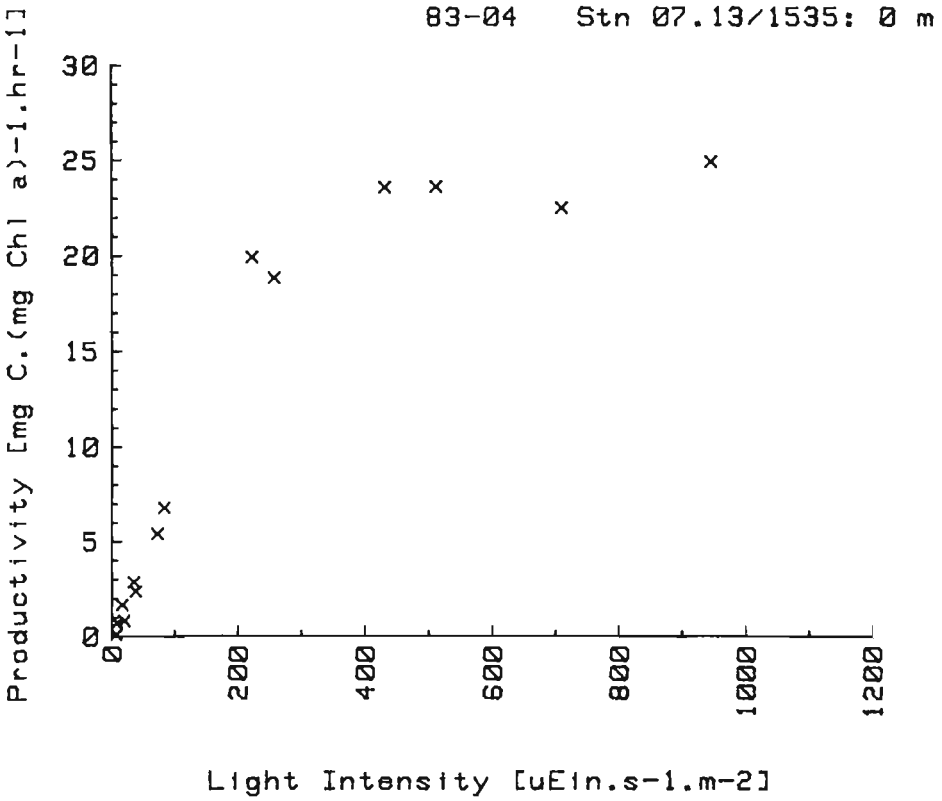

83-04 Stn 07.13/1032: 0 m
Productivity [mg C.(mg Chl a)-1.hr-1]
15
10
5
0
0
200
400
600
800
1000
1200
Light Intensity [uEin.s-1.m-2]

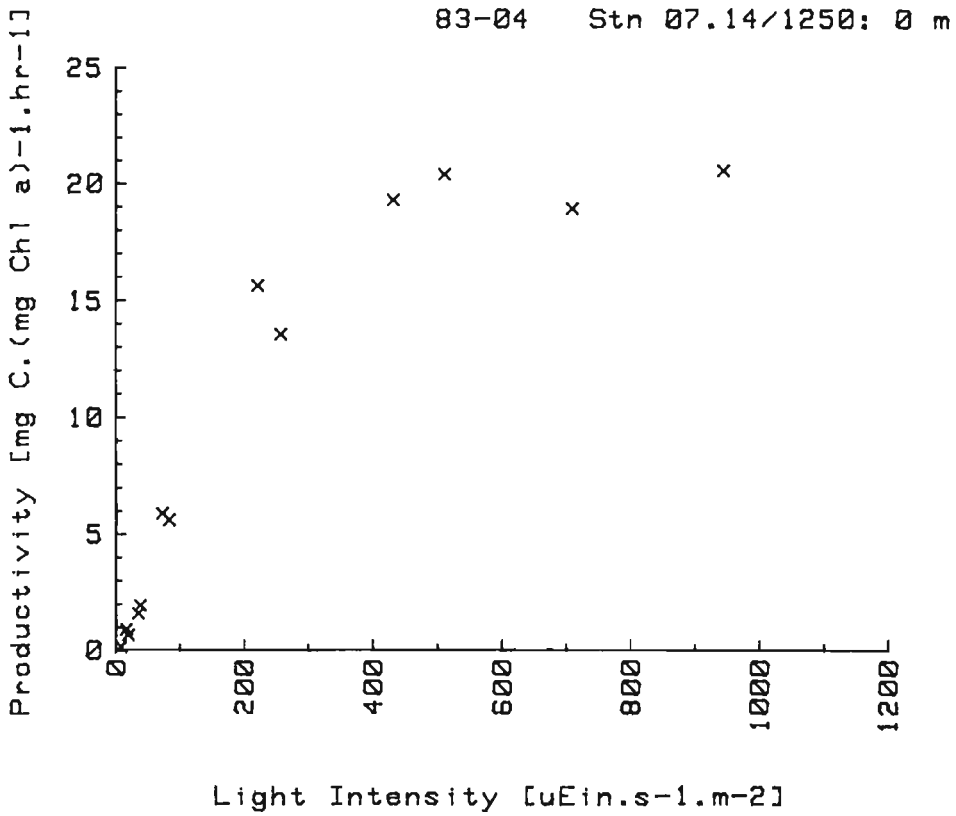
Cruise : 83-04	Date:	83.07.13		Depth:	0.0	m
Station: 07.13/1535	Time:	1354 (LAT)		Chlorophyll a:	.66	mg.m-3
		1535 (PDT)		Dis. Inorg. C:	2.47E+04	mg.m-3

Number of data points: 14

Cruise : 83-04	Date:	83.07.14		Depth:	0.0	m
Station: 07.14/1250	Time:	1109 (LAT)		Chlorophyll a:	.88	mg.m-3
		1250 (PDT)		Dis. Inorg. C:	2.50E+04	mg.m-3

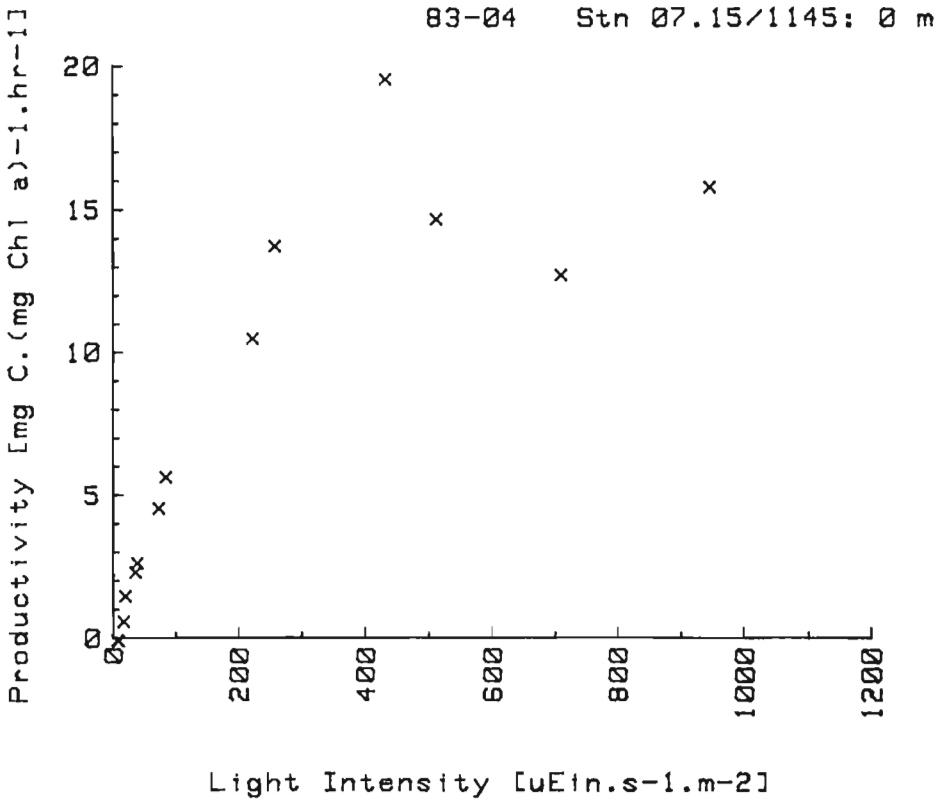
Number of data points: 13


83-04 Stn 07.13/1535: 0 m
Productivity [mg C.(mg Chl a)-1.hr-1]
30
25
20
15
10
5
0
0
200
400
600
800
1000
1200
Light Intensity [uEin.s-1.m-2]


83-04 Stn 07.14/1250: 0 m
Productivity [mg C.(mg Chl a)-1.hr-1]
25
20
15
10
5
0
0
200
400
600
800
1000
1200
Light Intensity [uEin.s-1.m-2]

Cruise : 83-04	Date:	83.07.15	Depth:	0.0	m
Station: 07.15/1145	Time:	1004 (LAT)	Chlorophyll a:	.71	mg.m-3
		1145 (PDT)	Dis. Inorg. C:	2.47E+04	mg.m-3

Number of data points: 14


83-04 Stn 07.15/1145: 0 m
Productivity [mg C.(mg Chl a)-1.hr-1]
20
15
10
5
0
0
200
400
600
800
1000
1200
Light Intensity [uEin.s-1.m-2]

IN SITU PRODUCTION EXPERIMENT

Cruise : 83-04 Date: 83.07.06
Station: 92 Time: 0759 (LAT)
0939 (PDT)

Subsmpl	Depth [m]	Chl a [mg.m-3]	D.I.C. [mg.m-3]	Light int. [uEin.s-1.m-2]	Production [mg C.(mg Chl a)-1.hr-1]
1	24.9	4.85	2.50E+04	.5	.78
2	24.9	4.85	2.50E+04	.5	.78
3	14.2	4.29	2.50E+04	19.0	2.38
4	14.2	4.29	2.50E+04	19.0	1.77
5	9.3	3.98	2.50E+04	50.0	8.74
6	4.0	4.44	2.50E+04	170.0	13.56
7	4.0	4.44	2.50E+04	170.0	15.00
8	1.8	3.92	2.50E+04	270.0	13.42
9	1.8	3.92	2.50E+04	270.0	12.50

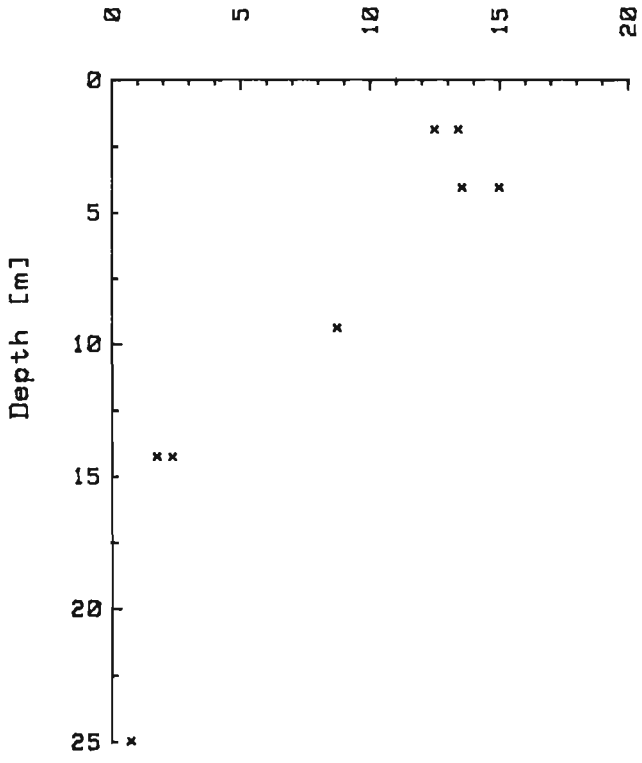
IN SITU PRODUCTION EXPERIMENT

Cruise : 83-04 Date: 83.07.08
Station: 111 Time: 0812 (LAT)
0953 (PDT)

Subsmpl	Depth [m]	Chl a [mg.m-3]	D.I.C. [mg.m-3]	Light int. [uEin.s-1.m-2]	Production [mg C.(mg Chl a)-1.hr-1]
1	24.1	6.00	2.47E+04	5.8	.66
2	24.1	6.00	2.47E+04	5.8	.63
3	19.1	5.66	2.47E+04	30.0	2.13
4	19.1	5.66	2.47E+04	30.0	2.26
5	14.0	3.69	2.47E+04	68.0	6.42
6	14.0	3.69	2.47E+04	68.0	6.41
7	9.2	.99	2.46E+04	170.0	11.28
8	9.2	.99	2.46E+04	170.0	10.70
9	4.1	.94	2.46E+04	340.0	12.68
10	4.1	.94	2.46E+04	340.0	10.57

83-04 Station: 92 (in situ)

Productivity [mg C.(mg Chl a)-1.hr-1]



83-04 Station: 111 (in situ)

Productivity [mg C.(mg Chl a)-1.hr-1]