Nereus Program Annual Meeting 2016 \\

MARIA DE OCA

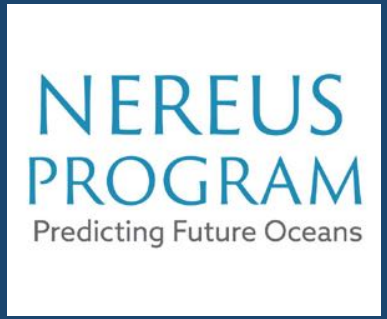
Duke
UNIVERSITY

Thank you \\

TOMOKA SWEET

LINDSAY LAFRENIERE

YOSHI OTA



Research \\

CLIMPP. PHYTOPLANKTON. BAYESIAN. WEBSITE. PACIFIC.

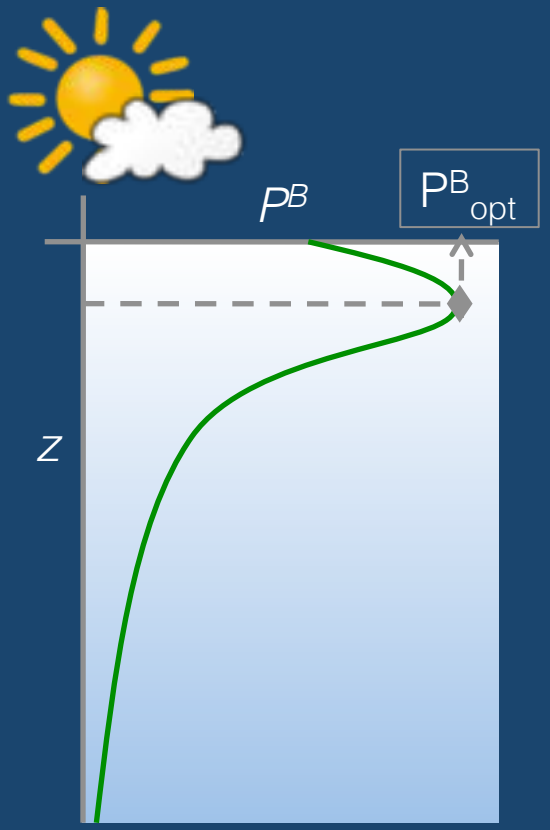
Outreach \\

CONSULTING. INNOVATION. DIVERSITY. COMMUNICATION.

Research \\

Does a Bayesian modeling approach capture P^{B}_{opt} dynamics in the equatorial Pacific?

P^B_{opt} = Maximum biomass-specific photosynthetic rate in a water column



Relevance:

-Photosynthetic efficiency

-Parameter of satellite production models

Generalized Joint Attribute Modeling (GJAM)

$$w_i \sim MVN\,(\mu_i, \Sigma)$$
$$\mu_i = \beta_i x_i$$

Prediction modeling with all data types and all responses jointly

Posterior simulation through Gibbs sampling using non-informative priors for both β and Σ.

Assumptions:

$$x_i = SST_i + MLD_i + PAR_i$$
$$w_i = P^b opt_i + CHL_i + IPP_i$$

Clark *et al.* (2015)

MLD has a bigger (-) effect on P^{B}_{opt} than SST

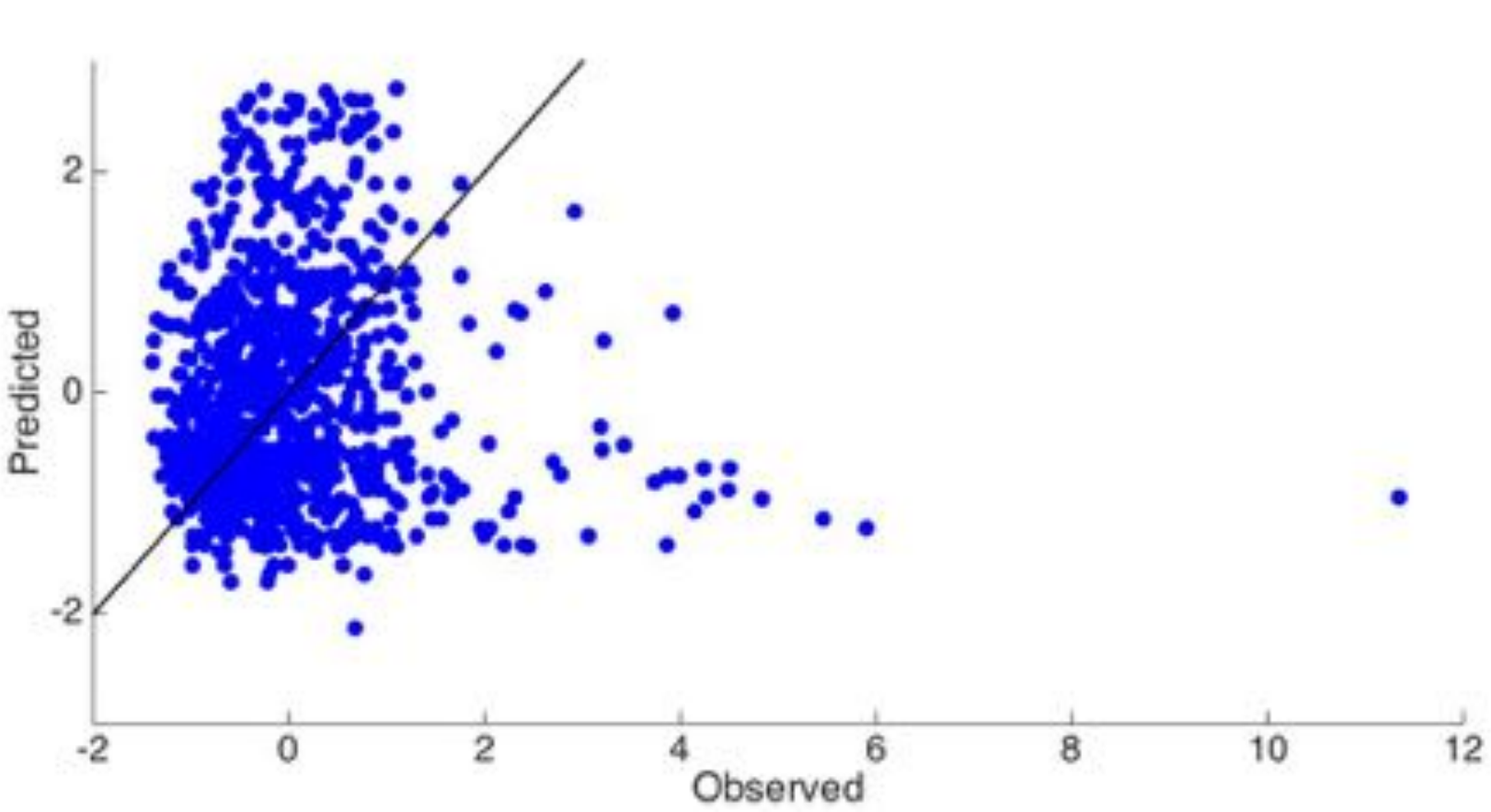
↓

Nutrient limitation

SIGMA

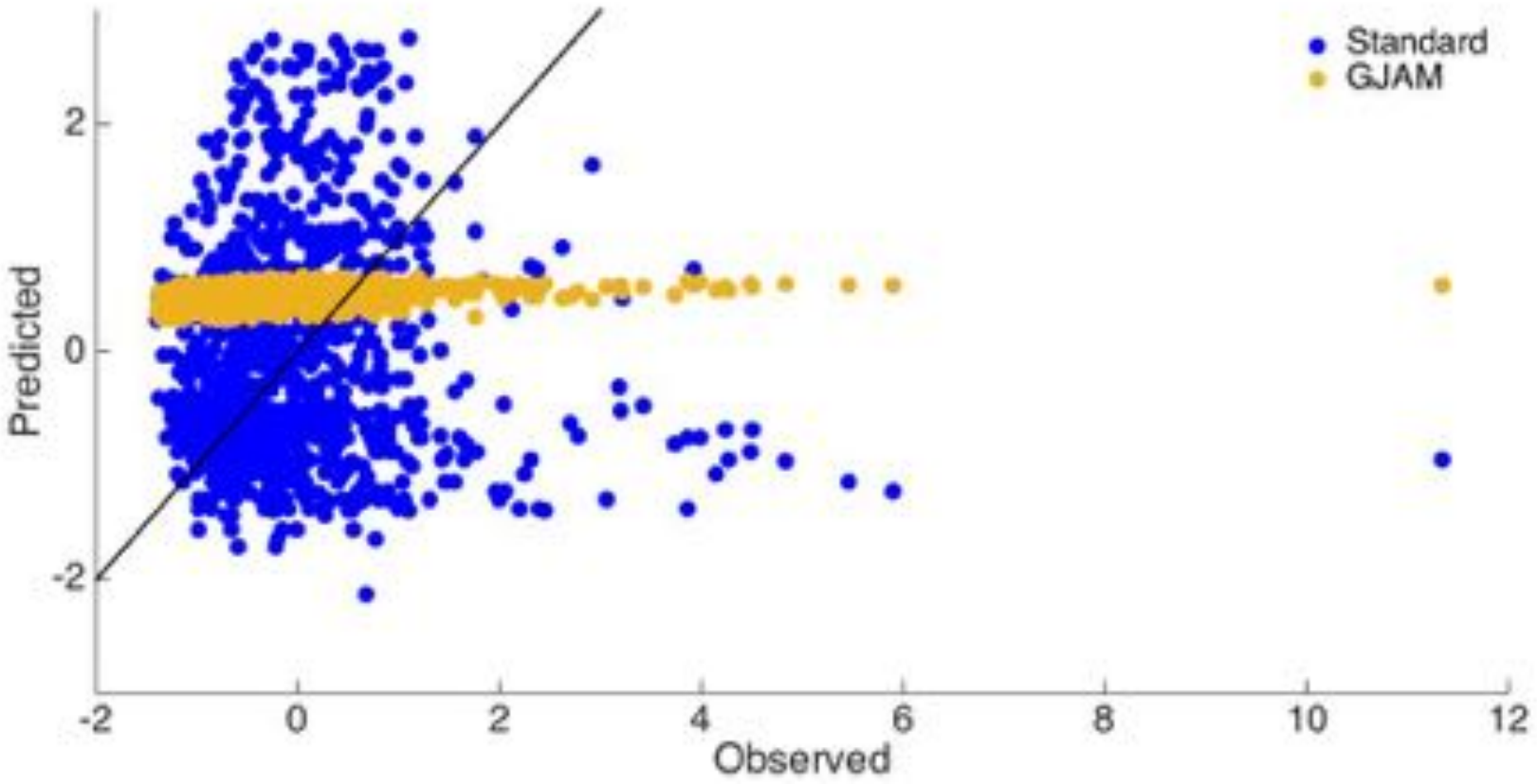
	P^B_{opt}	CHL	IPP
P^B_{opt}	0.6	-0.07	0.1
CHL	-0.07	0.4	0.1
IPP	0.1	0.1	0.4

Much of P^B_{opt} variance remains unexplained



PREDICTION

GJAM in-sample prediction and standard model do not capture P^b_{opt} variability



Conclusions

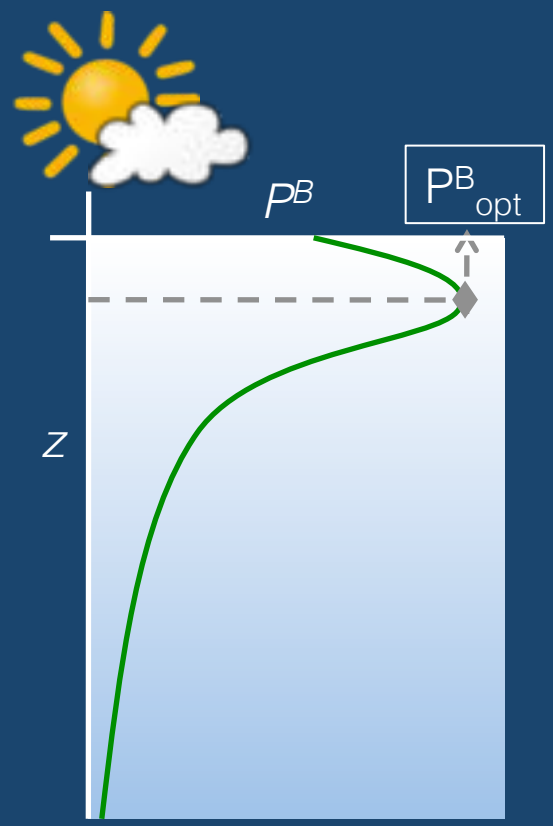
In the equatorial Pacific P^{B}_{opt} is not explained by the physical variables that should control productivity

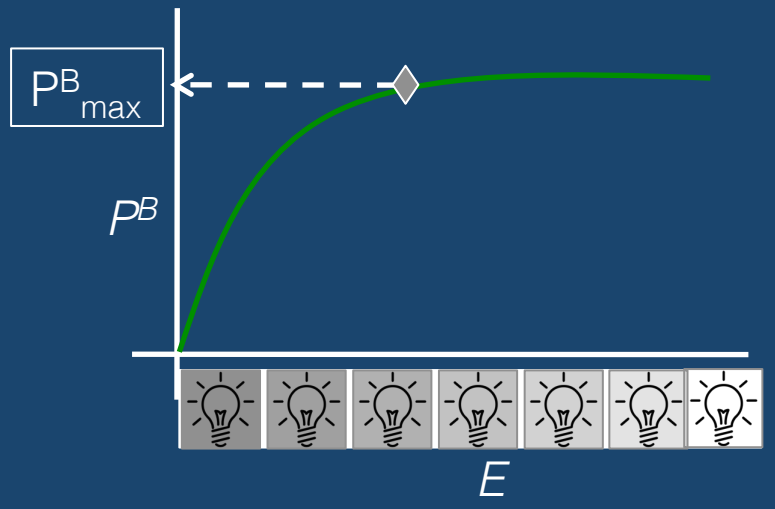
It is controlled by something else? Fe? Barber & Chavez (1991)

It is controlled by those physical variables but P^{B}_{opt} does not capture their effects? Côté & Platt (1984)

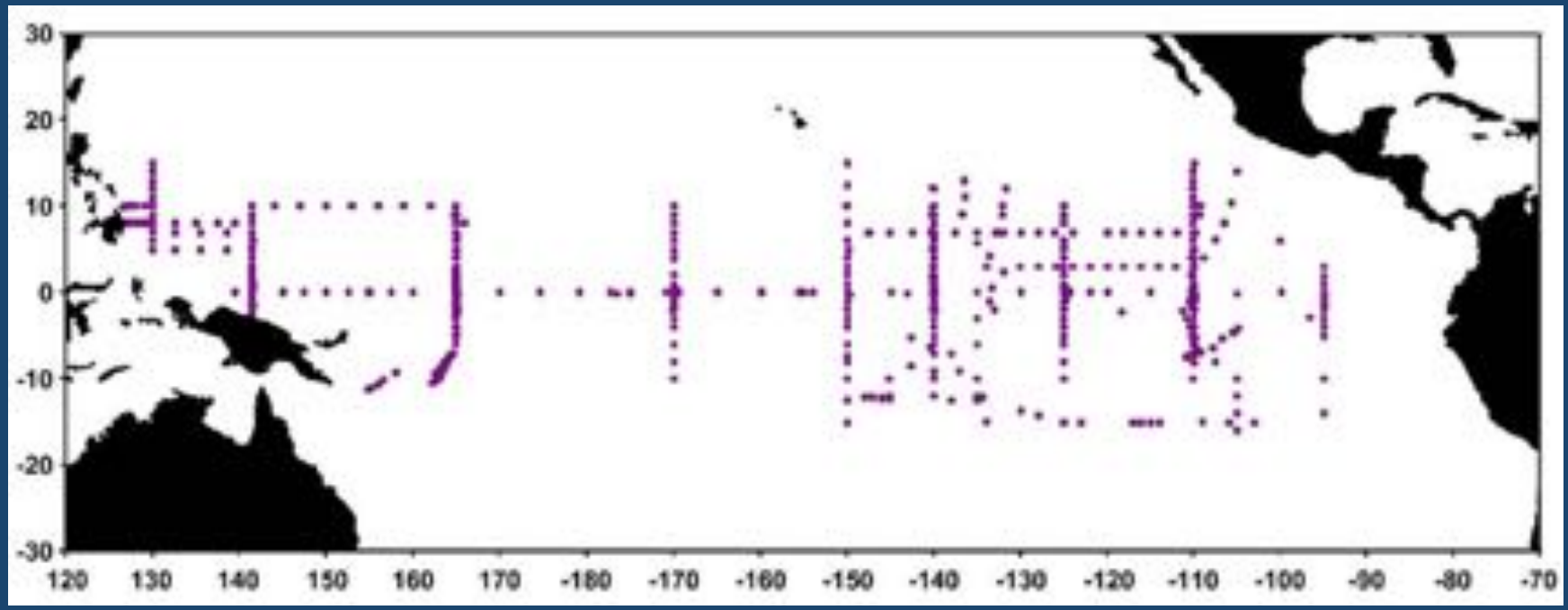
It's about the data?

CONCLUSIONS



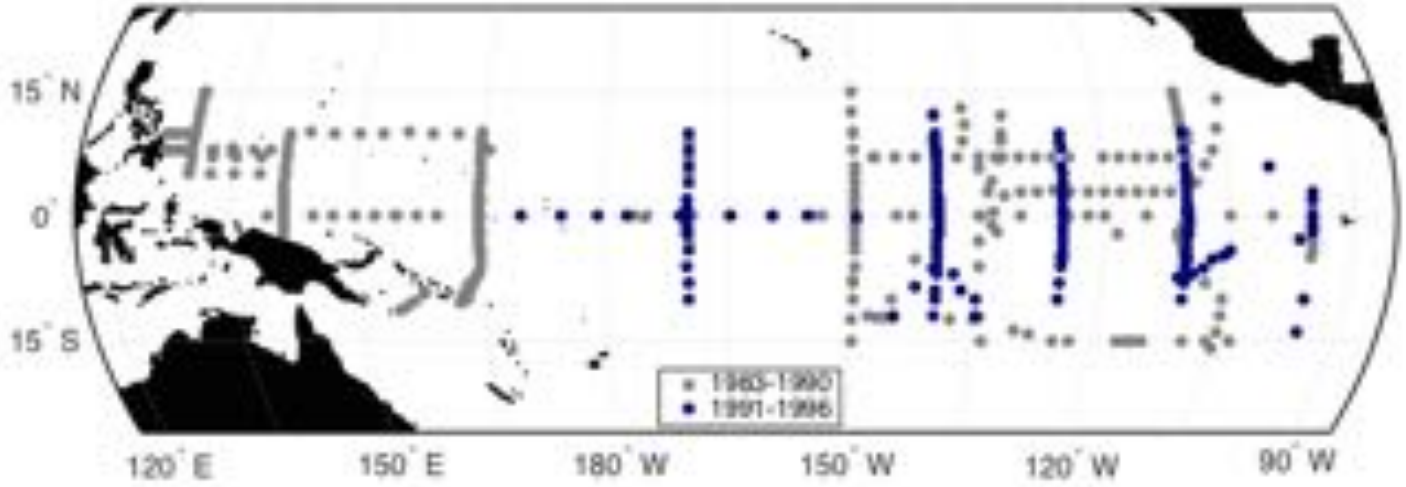


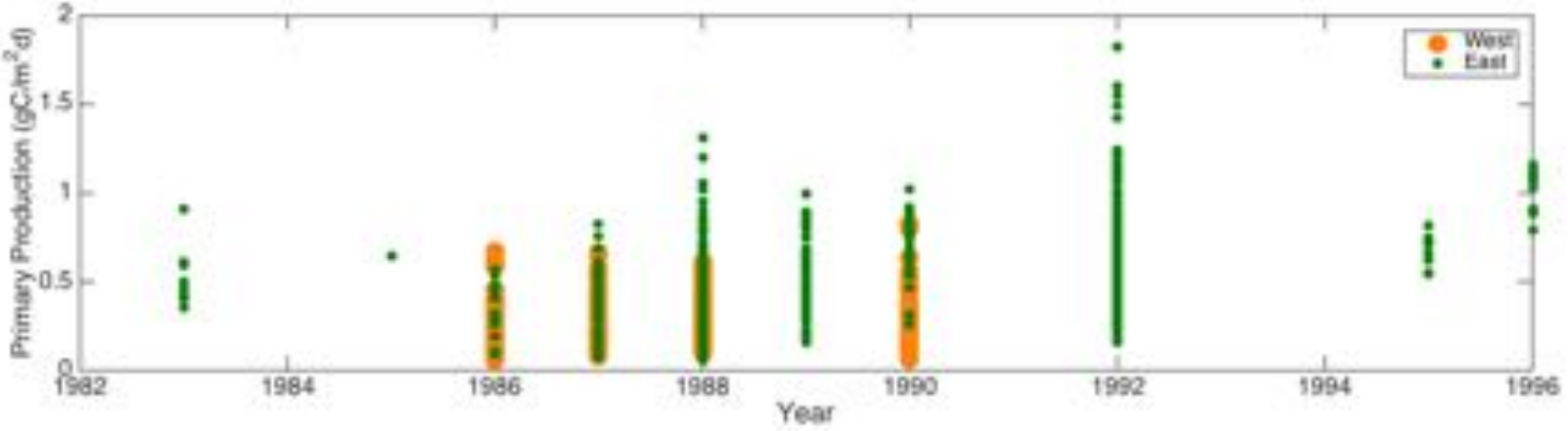
Côté & Platt (1984); Forget *et al.* (2007)

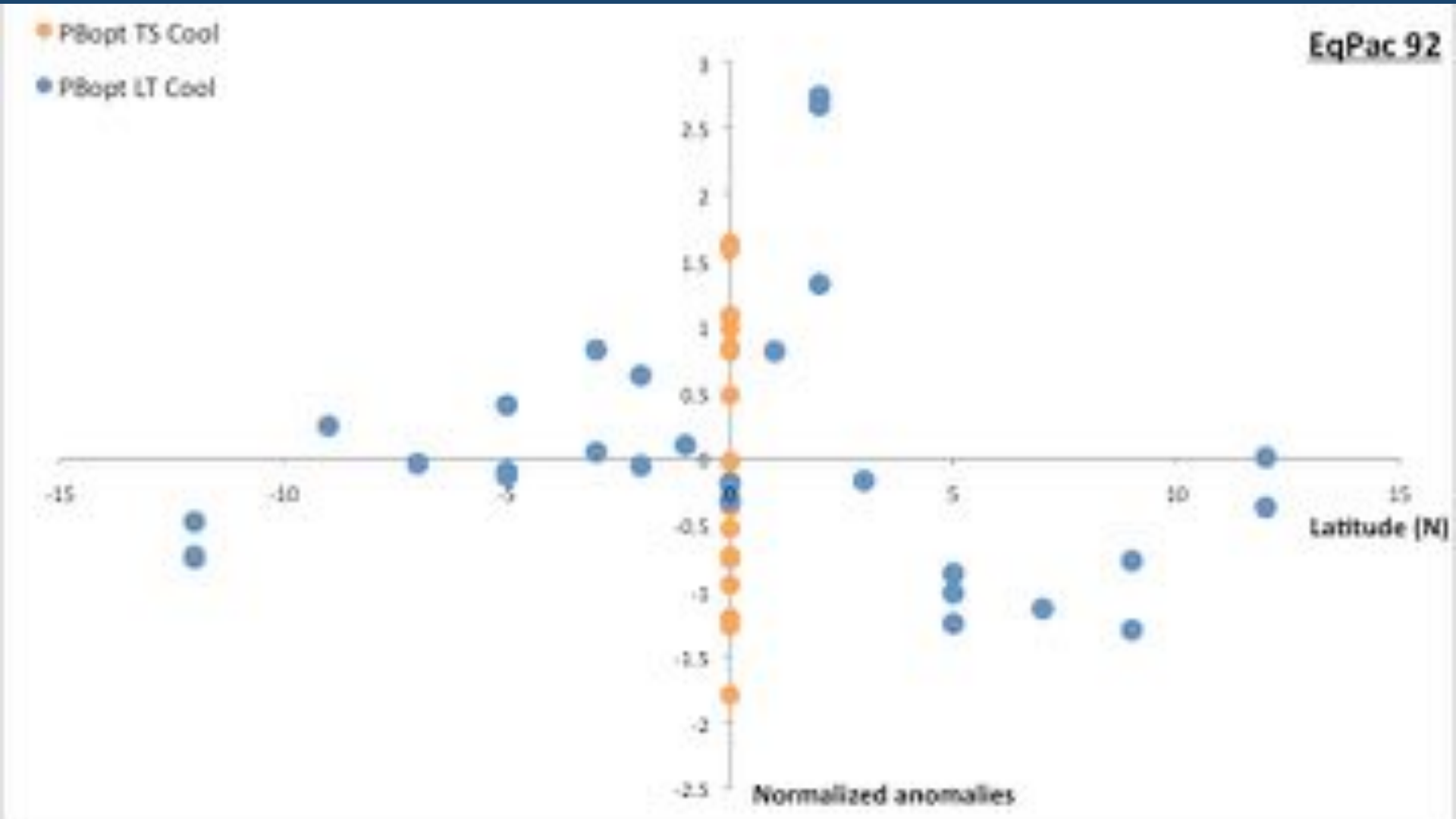


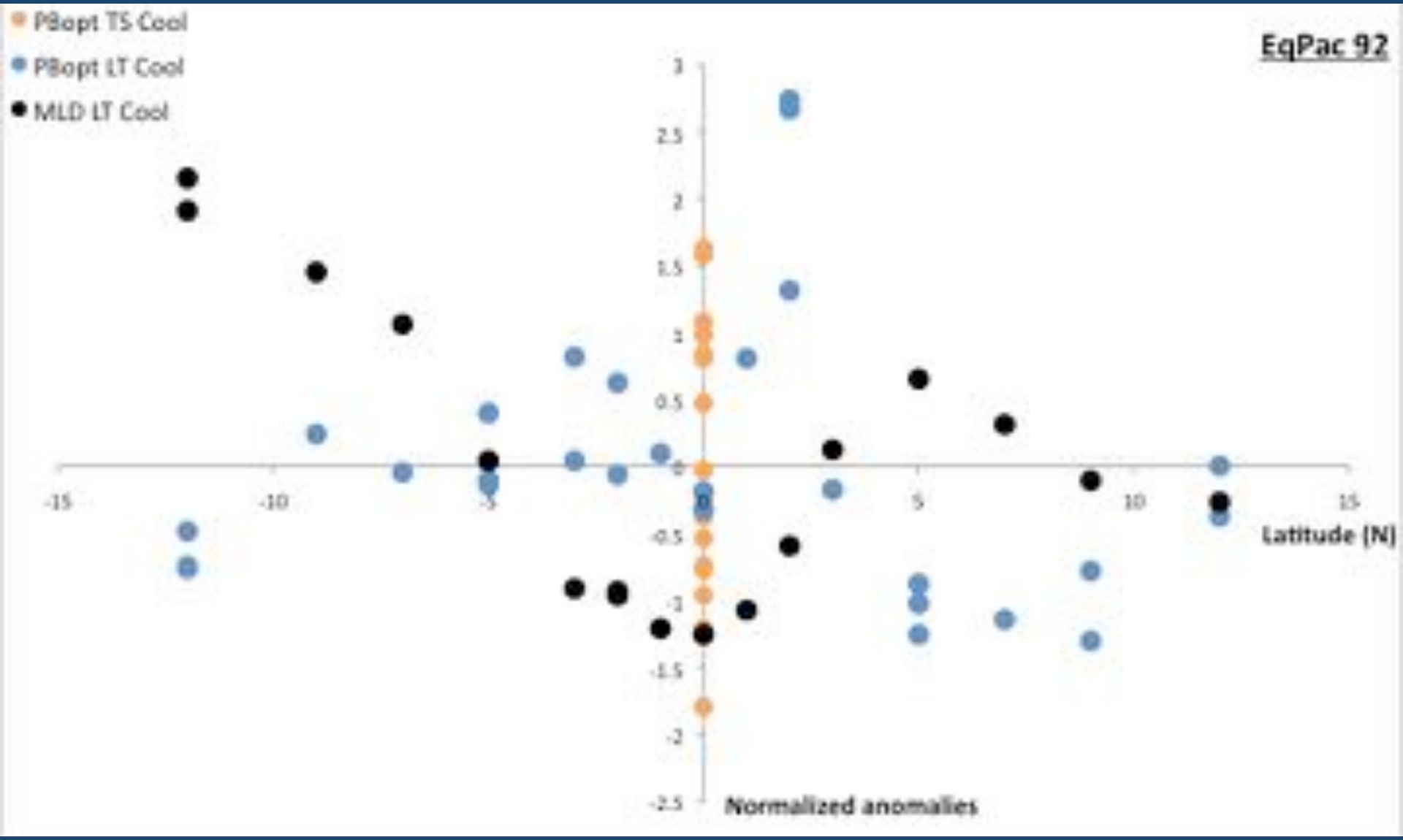
Friedrichs *et al.* (2009)

-Spatial sample distribution over time
-Time series vs transects
-Scale mismatch


15° N
0°
15° S
120° E
150° E
180° W
150° W
120° W
90° W
1983-1990
1991-1996


Primary Production (gC/m²d)
2
1.5
1
0.5
0
1982
1984
1986
1988
1990
1992
1994
1996
Year
West
East


PBopt TS Cool
PBopt LT Cool
EqPac 92
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-15
-10
-5
0
5
10
15
Latitude (N)
Normalized anomalies


PBopt TS Cool
PBopt LT Cool
MLD LT Cool
EqPac 92
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-15
-10
-5
0
5
10
15
Latitude (N)
Normalized anomalies

Limnol. Oceanogr., 36(8), 1991, 1803–1815

Regulation of primary productivity rate in the equatorial Pacific

R. T. Barber
Duke University Marine Laboratory, Beaufort, North Carolina

F. P. Chavez
Monterey Bay Aquarium Research Institute, Pacific Grove, Ca

Abstract

Analysis of the Chl-specific rate of primary productivit
concentration at >300 equatorial stations provides an
regulate primary productivity rate in the high-nutrient,

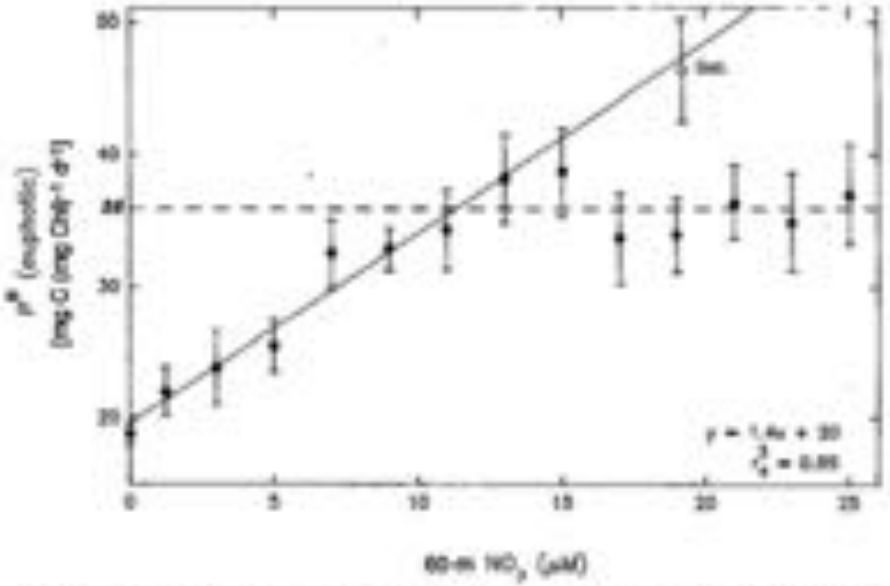
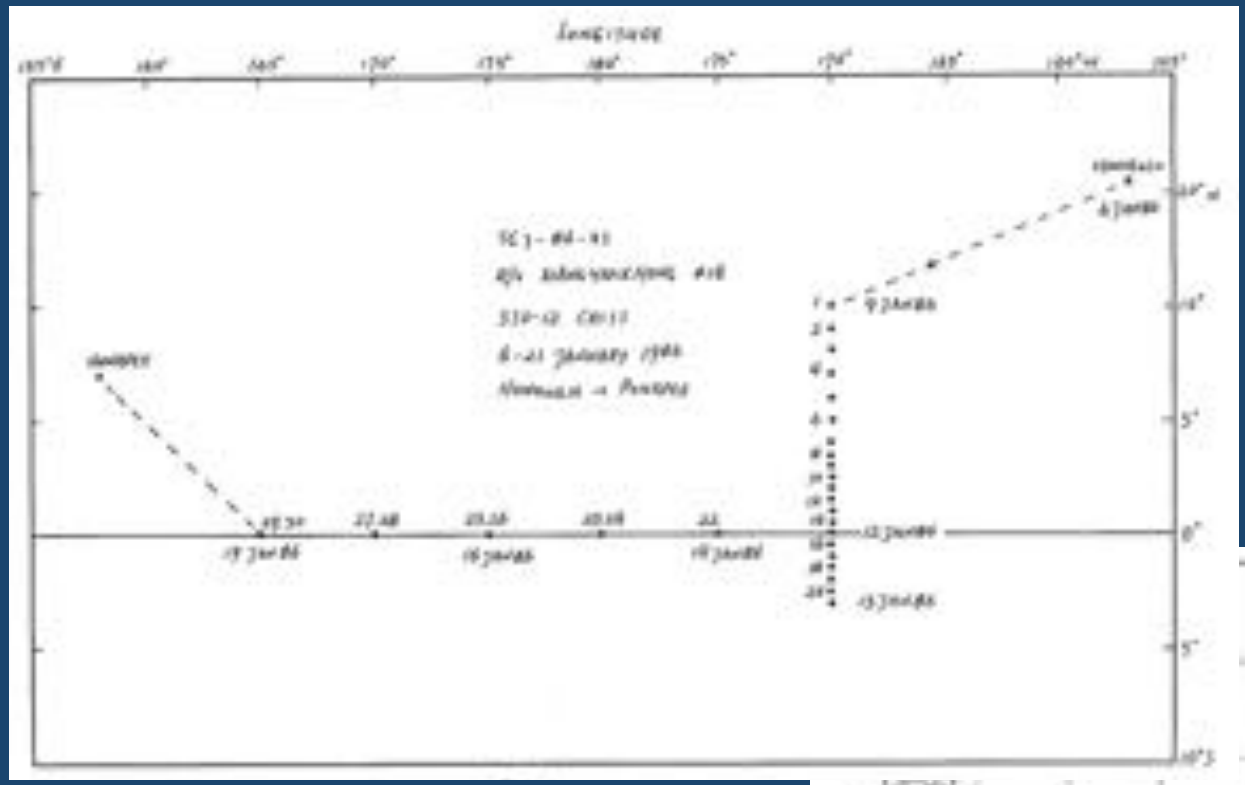
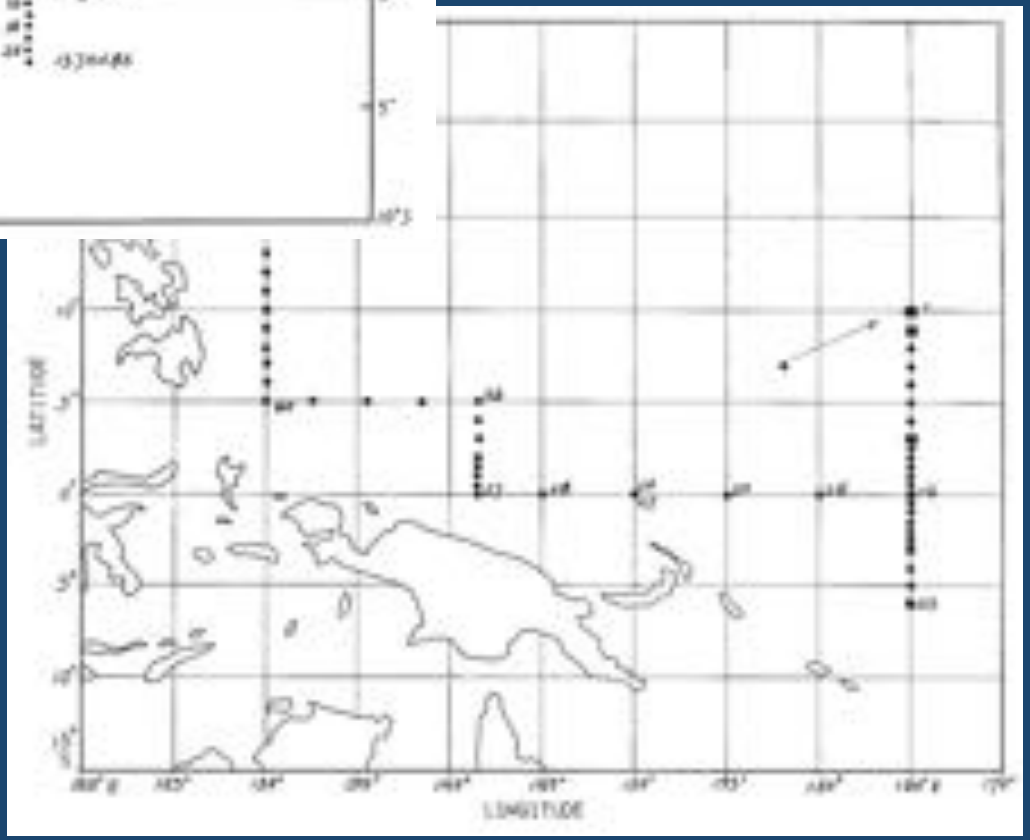


Fig. 5. The Chl-specific primary productivity rate (P^B) as a function of 60-m NO_3 concentration (●). The values given are mean and standard error (SE) of the mean for each NO_3 bin. The regression was determined with the first eight points; the mean Galapagos rate (◇) for the 19 stations adjacent to the islands was not included in the regression, but note that the observed value is close to the value predicted by the regression. The *limited* P^B of ~36 mg C(mg Chl)$^{-1}$ d^{-1} is the mean of the last seven NO_3 bins.

Year	Month	Longitude	Ship	Cruise	References
1983	Dec	85-95°W	*Endeavor*	***BEED***	
1985	March-April	85-95°W	*Wecoma*	***BEED***	
1986	Jan-March	130°E-170°W	*Xiangyanghong*	***PRC1***	USA-PRC (1986)
	Nov-Dec	122-165°E	*Xiangyanghong*	***PRC2***	
1987	June-Jul	90-150°W	*Researcher*	*RTEW*	
	Jul-Aug	147-165°E	*Oceanographer*	*OTEW*	
	Sept-Oct	122-165°E	*Xiangyanghong*	*PRC3*	
	Oct-Nov	110-140°W	*Oceanographer*	***EPOCS***	
1988	Feb-March	150°W	*Wecoma*	***WEC***	Barber (1992)
	March-April	133-137°W	*Wecoma*	***WEC***	Cullen *et al.* (1992)
	April-May	122-165°E	*Xiangyanghong*	***PRC4***	
	May	140-170°W	*Oceanographer*	***TOGA***	
	June-July	110-140°W	*Oceanographer*	***TOGA***	
	July	110-135°W	*Oceanographer*	***TOGA***	
	Oct-Dec	110-145°W	*Oceanographer*	***TOGA***	
	Oct-Nov	122-165°E	*Xiangyanghong*	*PRC5*	
1989	Feb-April	105-140°W	*Discoverer*	*TOGA*	
	April-June	85-175°W	*Malcolm Baldridge*	***TOGA***	
	Oct-Dec	110-148°W	*Discoverer*	***TOGA***	
1990	April-May	110-140°W	*Malcolm Baldridge*	***TOGA***	
	June-Jul	122-165°E	*Xiangyanghong*	*PRC8*	
1992	Feb-March	140-170°W	*Thompson*	*TT007*	
	March-April	140-143°W	*Thompson*	*TT008*	Barber *et al.* (1996)
	Aug-Sept	135-140°W	*Thompson*	*TT011*	Murray *et al.* (1995)
	Sept-Oct	140-145°W	*Thompson*	*TT012*	Lindley *et al.* (1995)
	March-May	110-170°W	*Discoverer*	*NOAA*	
	Sept-Dec	77-140°W	*Researcher*	*NOAA*	
1993	Oct-Nov	90-150°W	*Iselin*	*IronEx-1*	
	Nov	89-93.5°W	*Iselin*	*PlumEx*	
1996	April-May	165°E-150°W	*Thompson*	*Zonal Flux*	
	May-June	111-104°W	*Melville*	*IronEx-2*	




LATITUDE
LONGITUDE

PRELIMINARY REPORT — In situ Da

STATION DATA

Station No.	[illegible]	Date	- [illegible]	[illegible] Da	Wind Speed	[illegible]
Station Name	[illegible]	Meas Time	- [illegible]	[illegible]	Wind Dir	[illegible]
Latitude	[illegible]	Date	- [illegible]	[illegible] Da	Bar Press	[illegible]
Longitude	[illegible]	Meas Time	- [illegible]	[illegible]	Depth Sea	[illegible]
					Secchi Dep	[illegible]

Depth	RealDep	Temp	Salinity	Density	Oxygen	Nitrate	Nitrite
[illegible]							
1000	--	--	--	--	--	--	--

Depth	Phosphate	Silicate	Chloro	Pheo	P/Ch
[illegible]					
1000	--	--	--	--	--

CARBON REPORT

S. D. I.	Depth	Chl a	Pheo	Carbon	Prod Ind	Int Dep
[illegible]						
0.1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

INTEGRATED VALUES (integrated to 0.1 S.D.I.)

Chlorophyll a	23.38 MG/M2	Carbon Fixation	[illegible] MG/M2/DA
Phaeophytin	24.35 MG/M2	Productivity Index	3.99 MG-C/MG-CHL/DA

shiny.env.duke.edu

ClimPP

About Down

JS map by amCharts

All
All 1983 1985 1986 1987 1988 1989 1990 1992 1995
1996

JS chart by amCharts

Show all

sfco chl. [mg m-3]
IPP [g C m-2 d-1]

0.8 0.7 0.6 0.5 0.4 0.3 0.2 0.1 0.0
2.0 1.5 1.0 0.5 0.0

1984 1986 1988 1990 1992 1994 1996

IPP Chl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CLIMPP
About
Download
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JS map by amCharts
All
All
1984
1985
1986
1987
1988
1989
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1992
1995
1996
JS chart by amCharts
Show all
sfca chl. [mg m-3]
PP [g C m-2 d-1]
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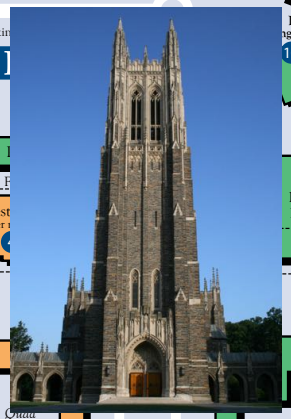
Chl

Outreach \\



DISI duke interdisciplinary social innovators.

Impact Assessment

Strategy

Marketing

SSP

NCCADV
North Carolina Coalition Against Domestic Violence

the Institute for Southern Studies

WARM
Wilmington Area Rebuilding Ministry

North Carolina Advocates for Justice
Protecting people's rights.

NCPIRG

Comprehensive Community Solutions

YES Youth Education for Savings

URBAN MINISTRIES OF DURHAM

DISI duke interdisciplinary social innovators.

duke.edu

ADMISSIONS ACADEMICS RESEARCH **Duke** UNIVERSITY GLOBAL ARTS SCHOOLS & INSTITUTES

Duke in Action

Duke Student Group Develops Plan to Beautify Durham, NC

The nonprofit Keep Durham Beautiful does exactly what their name implies in Durham, N.C. Trouble is, they are a small organization and they needed some help to make sure they were effectively tracking impact. They turned to a volunteer student group out of Duke University, the Duke Interdisciplinary Social Innovators (DISI) for help. The DISI team includes students from the Sanford School of Public Policy, Fuqua School of Business and the Pratt School of Engineering. DISI is a model of innovation and community service, and is entirely run by students.

DISI duke interdisciplinary social innovators.

SHARING NEW IDEAS, CREATIVE STRATEGIES, AND CUTTING-EDGE TOOLS TO REALIZE SOCIAL MISSIONS

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DukeTODAY

NEWS OPINION WORKING@DUKE STUDENTS ALUMNI

President Creates Task Force on Bias and Hate Issues

The task force has been charged with a broad review of Duke's policies, practices and culture as they pertain to bias and hate in the Duke student experience

November 19, 2015 |

ARTICLE

DURHAM, NC - In an email to all students, faculty and staff, President Richard H. Brodhead announced Thursday the creation of a Task Force on Bias and Hate Issues.

The task force will be co-chaired by Kelly Brownell, dean of the Sanford School of Public Policy and Robert L. Flowers Professor of Public Policy, and Linda Burton, dean of social sciences and James B. Duke Professor of Sociology. They will be joined by faculty, staff and students from across the university.

The president and Provost Sally Kornbluth have charged the task force with a broad review of Duke's policies, practices and culture as they pertain to bias and hate in the Duke student experience. In its capacity as an advisory committee to the president and the provost, it will bring forward ideas, strategies and recommendations. In specific, the task force is asked to:

– Consider whether Duke's institutional policies should have specific mention of bias and hate;

– Consider issues related to communications of incidents of intolerance; and

– Make recommendations for achieving greater transparency in the handling of issues of intolerance.

In his message to the community, Brodhead wrote, "While administrative actions cannot solve all the problems we face, I believe that this task force will be a positive step in creating a productive dialogue about the ways we can change Duke for the better. I welcome your participation in this effort."

spotlight.duke.edu

Duke UNIVERSITY | Task Force on Bias and Hate

TASK FORCE REPORT CAMPUS RESOURCESS COMMITTEE

Task Force on Bias and Hate

Completed Listening Tours

In an effort to hear from community members, the committee is taking on a series of listening tours. Come and share your thoughts, challenges and recommendations as we work towards creating a more inclusive campus environment.

- March 2 – Nicholas School of the Environment, 1:30 – 2:30 p.m., Field Auditorium
- March 3 – Blue Devils United, 7-8 p.m., Center for Sexual and Gender Diversity

Acknowledgements \\

Pat Halpin, Jim Clark, Dick Barber, Charlie Stock
CLARK LAB – Bijan, Chase
COMPUTER SC. DEPT. – Mercy, Animesh
MGEL – Shay, Erin, Ben, Ben, Andre, Daniel
DUKE MARINE LAB – Lisa Campbell
DISI TEAM & TASK FORCE

Duke MARINE LAB

NICHOLAS SCHOOL OF THE ENVIRONMENT
forging a sustainable future

1926 DUKE THE GRADUATE SCHOOL

Questions \& Suggestions