PERU: OCEANOGRAPHIC TIME SERIES

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Global Intercomparability in a CHANGING OCEAN

CALLAO TIME SERIES

One of the most important zones is Callao, located in the central coastal area of Peru (12°03' S/ 77°30' W to 20 mn)

Callao has an important time series initiated in 1990-92 which takes monthly/bimonthly. Measurements of nutrients, chl-a, pH, dissolved oxygen and other parameters at 4 sites off the Peruvian coast (Figure 1).

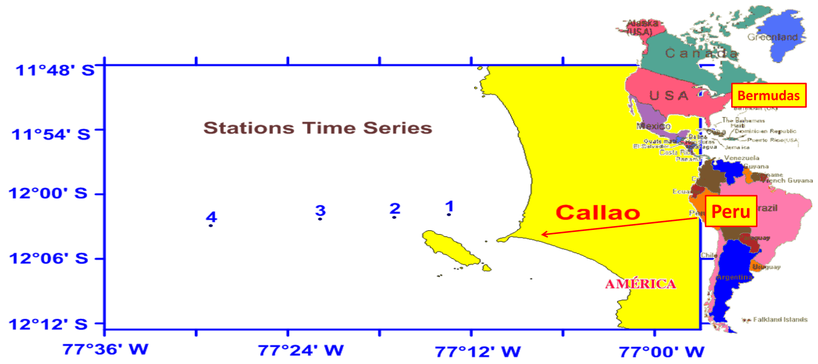

Figure 1: Map of selected sites. Callao Time-Series .

CALLAO TIME SERIES: METHODS

Typical table of Main biogeochemical parameters measured at the Callao Time-Series

YEAR	CRUISE	SHIP	DATE	HOUR_GMT -5:00	STATION	LATITUDE	LONGITUDE	DEPTH (m)	TEMPERATURE (°C)	SALINITY (ups)	OXYGEN (mL/L)	CHLOROPHYLL (µg/L)	PHOSPHATE (µM)	SILICATE (µM)	NITRATE (µM)	NITRITE (µM)	PH	NOAA
2007	EF_CALLAO	IMARPE_V	10/26/07	05:40	4	-12.04875	-77.48283	0	14.81	34.942	5.91	17.02	1.44	24.35	3.50	0.12	8.12	-1.76
2007	EF_CALLAO	IMARPE_V	10/26/07	05:40	4	-12.04875	-77.48283	10	14.80	34.939	5.86	14.28	2.24	1.96	2.01	0.01	8.11	-1.76
2007	EF_CALLAO	IMARPE_V	10/26/07	05:40	4	-12.04875	-77.48283	25	13.97	34.943	2.44	1.86	1.68	7.02	6.11	0.70	7.61	-1.76
2007	EF_CALLAO	IMARPE_V	10/26/07	05:40	4	-12.04875	-77.48283	50	13.20	34.926	0.48	0.28	2.74	12.96	11.37	0.07	7.67	-1.76
2007	EF_CALLAO	IMARPE_V	10/26/07	05:40	4	-12.04875	-77.48283	75	12.85	34.907	0.29	0.15	2.66	16.38	12.56	0.26	7.65	-1.76
2007	EF_CALLAO	IMARPE_V	10/26/07	05:40	4	-12.04875	-77.48283	100	12.71	34.930	0.19	0.34	3.08	17.21	14.65	1.02	7.64	-1.76
2007	EF_CALLAO	IMARPE_V	10/26/07	05:40	4	-12.04875	-77.48283	140	12.55	34.895	0.19	0.23	3.06	31.12	10.66	5.51	7.63	-1.76
2008	EF_CALLAO	IMARPE_V	10/22/08	12:05	4	-12.04650	-77.48433	0	16.13	34.991	5.14	19.97	1.50	3.27	8.70	0.42	8.02	0.32
2008	EF_CALLAO	IMARPE_V	10/22/08	12:05	4	-12.04650	-77.48433	10	16.08	34.993	5.12	18.31	1.24	3.32	6.67	0.05	8.02	0.32
2008	EF_CALLAO	IMARPE_V	10/22/08	12:05	4	-12.04650	-77.48433	25	15.46	35.008	2.85	6.59	1.59	6.78	9.20	0.29	7.91	0.32
2008	EF_CALLAO	IMARPE_V	10/22/08	12:05	4	-12.04650	-77.48433	50	14.17	34.979	0.29	0.36	1.87	18.49	13.95	0.32	7.75	0.32
2008	EF_CALLAO	IMARPE_V	10/22/08	12:05	4	-12.04650	-77.48433	75	13.48	34.953	0.29	0.18	1.92	24.35	12.34	1.95	7.72	0.32
2008	EF_CALLAO	IMARPE_V	10/22/08	12:05	4	-12.04650	-77.48433	100	13.12	34.933	0.24	0.08	2.17	23.96	13.83	2.32	7.70	0.32
2008	EF_CALLAO	IMARPE_V	10/22/08	12:05	4	-12.04650	-77.48433	140	12.85	34.914	0.24	0.05	2.53	28.61	12.91	3.27	7.69	0.32

CALLAO TIME SERIES: SOME RESULTS

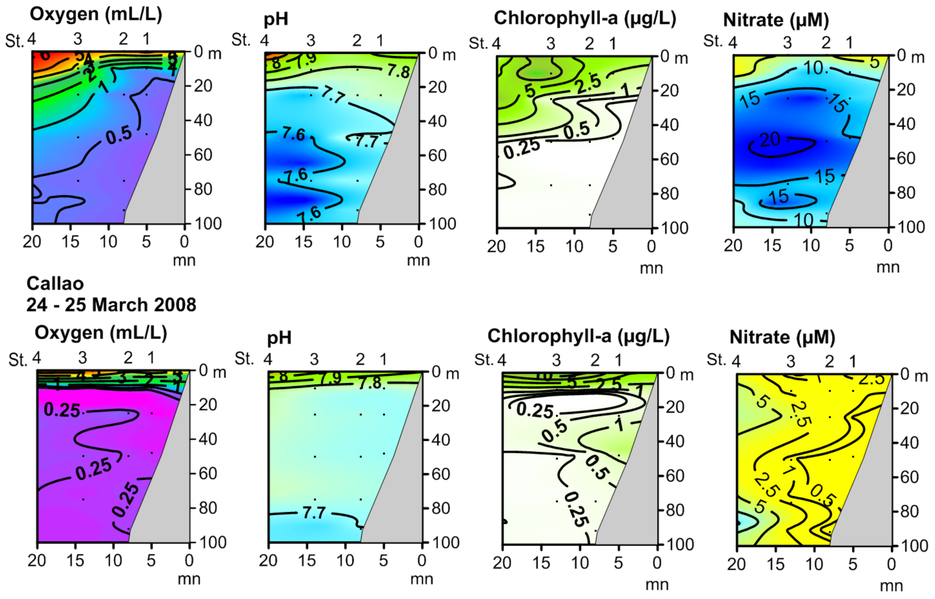

Figure 2: Profiles of Dissolved Oxygen, pH, Chl*a* and Nitrate during march 2007-2008.

SURFACE VARIABILITY

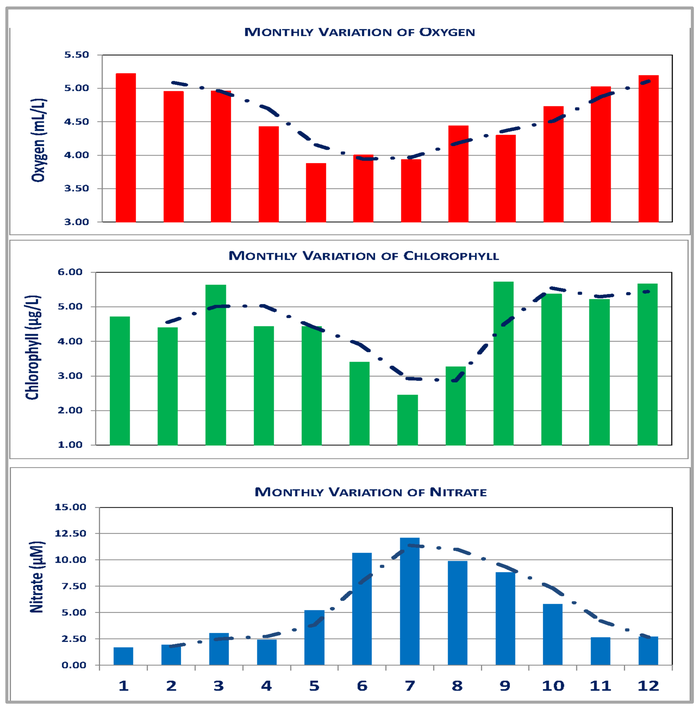

Figure 3: Monthly Variability of Dissolved oxygen, Chl*a* and Nitrate concentrations in the surface seawater, 11°30' – 12°30' S – 76°50' – 77°30' W. Data 1961 – 2008.

SURFACE DISTRIBUTION OF CHLOROPHYLL

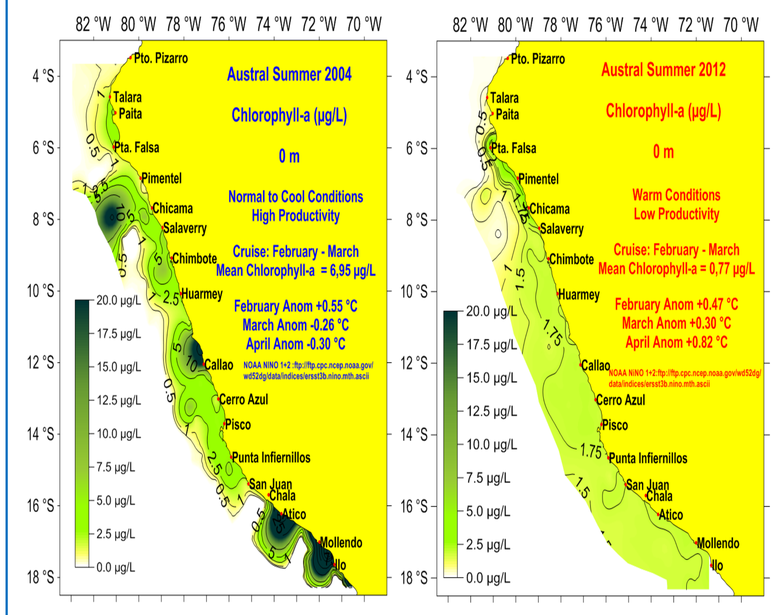

Figure 4: Measurement of Chlorophyll-a with pheophytin correction by Fluorescence. ENSO events: Cold Condition, Summer 2004 and Warm Condition Summer 2012, affect the biogeochemistry off Peru.

VERTICAL DISTRIBUTION OF OXYGEN: 20 mn FROM SHORE, TIME AND DEPTH

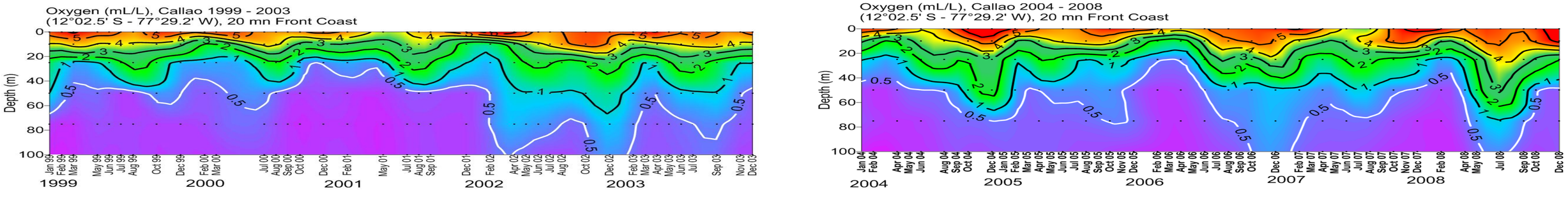

Figure 5: Vertical Distribution Of Oxygen: 20 mn from Shore, Time and Depth. Profiles of Dissolved Oxygen measured at the Callao Time Series between 1999 - 2008.

CONCLUSION

Time series biogeochemistryshows, Peru is the most variable coastal upwelling system and may yield more fish as a result.

FUNDING SOURCES

IMARPE – Project Variability Biogeochemistry

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