DISTRIBUTION OF TRANSPARENT EXOPOLYMER PARTICLES IN THE EASTERN TROPICAL SOUTH PACIFIC

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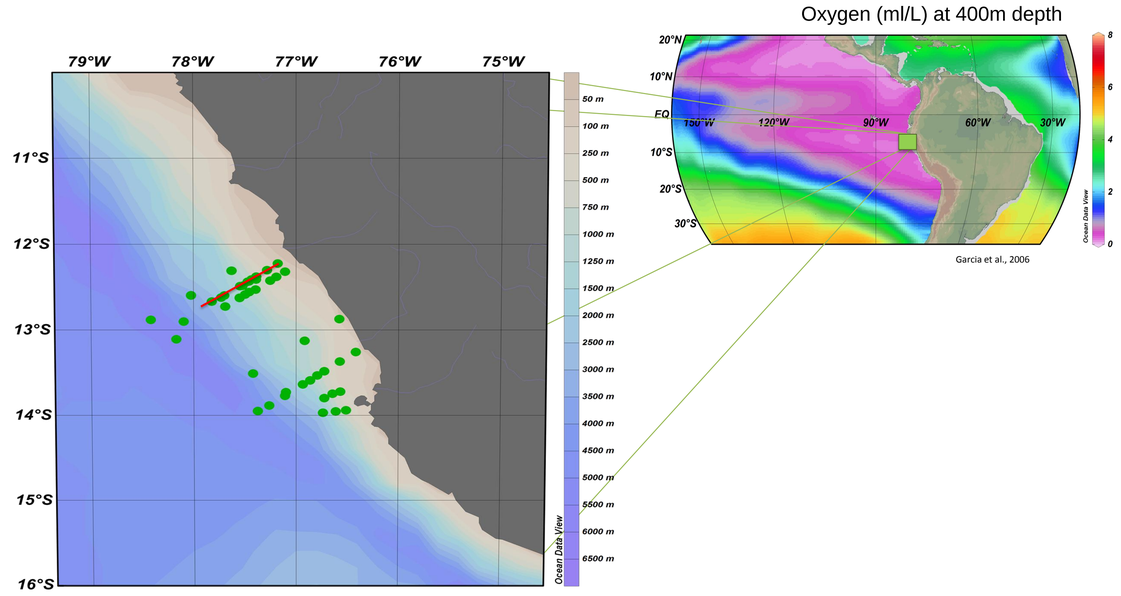
Goal

To examine *Transparent Exopolymer Particles* (TEP) distribution in relation to the biogeochemistry of the *Eastern Tropical South Pacific* (ESTP) region influenced by the coastal upwelling and the underlying *Oxygen Minimum Zone* (OMZ)

Motivation

- *TEP distribution* in zones influenced by coastal upwelling regimes and OMZs is *largely unknown*
- Tropical OMZs (e.g. *ESTP OMZ*) are the key regions in understanding of *oxygen* and nutrient cycling, *biological productivity* and CO_2-fixation in the ocean
- *TEP* play important role in carbon cycling, serving a *mediator* between *dissolved* and *particulate* organic matter pools (Engel et al., 2004)
- *TEP* serve *nutrients* and *attachment surfaces* for bacteria (Alldredge et al., 1993), supporting *biological oxygen consumption*

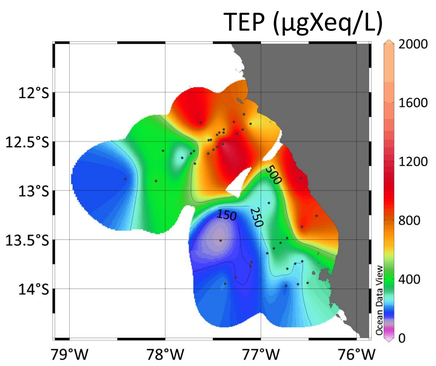
Oxygen (ml/L) at 400m depth

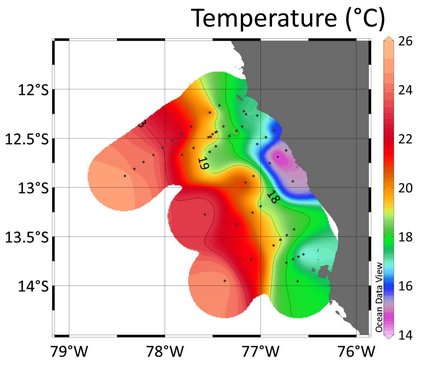


Map: Sampling site during M93 cruise (Feb – March 2013). Transect, used for plotting, is shown with red line.

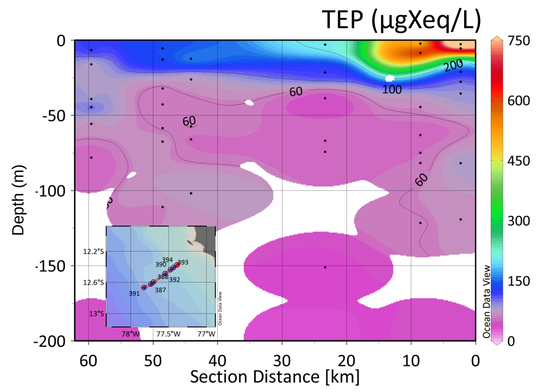
First results

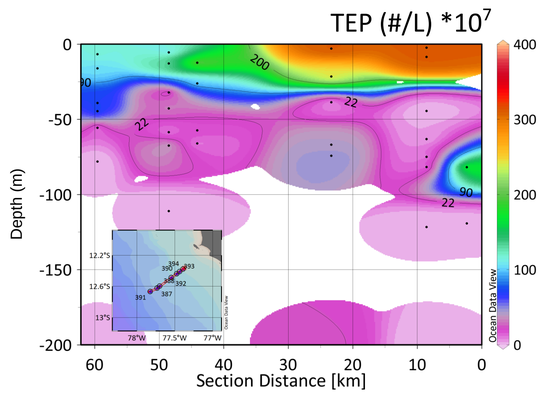
Surface distribution of TEP (µgXeq/L) and temperature (°C) at 5m depth

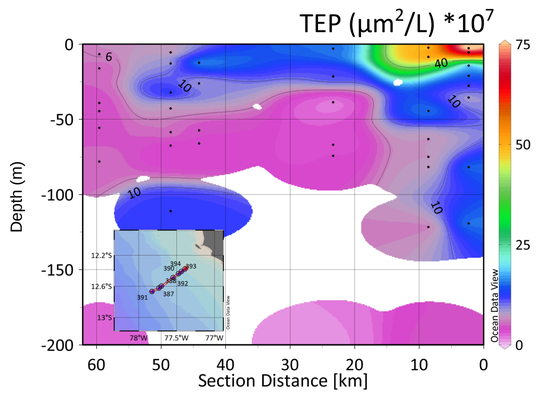


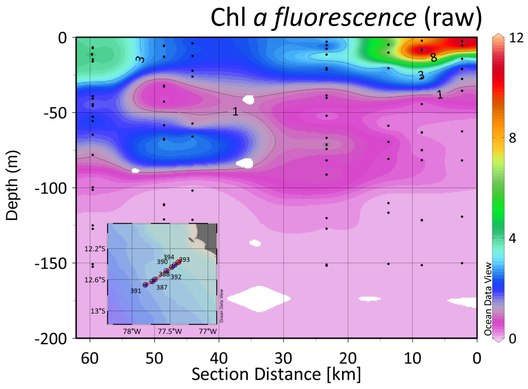


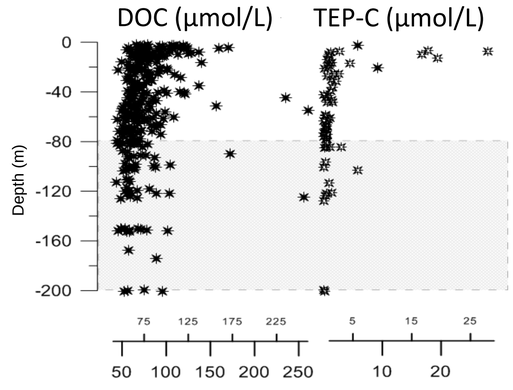
Vertical distribution of TEP (µgXeq/L), TEP (#/L), average TEP size (µm^{2}/L), Chl *a-fluorescence*, Dissolved Organic Carbon (DOC; µmol/L) and carbon included in TEP (TEP-C; µmol/L), and Oxygen (µmol/L), transect, used for the pictures schematically shown on the Map.

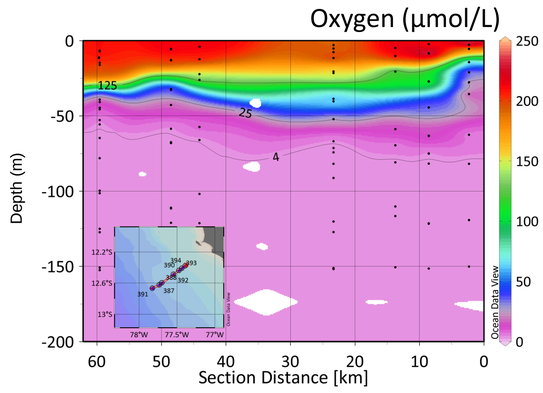




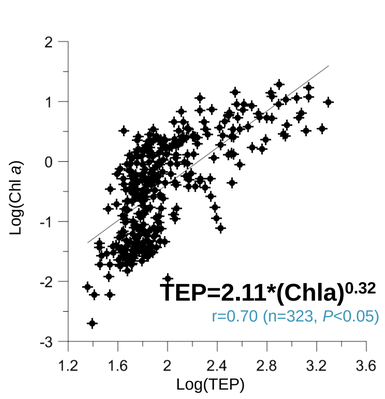


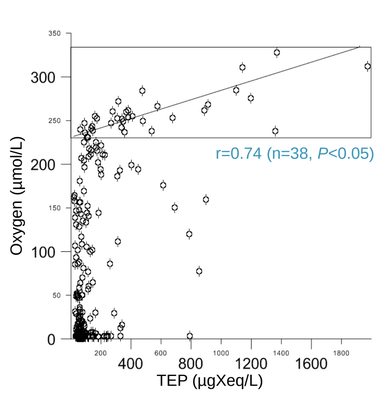






Covariance of TEP vs Chl a fluor. and TEP vs Oxygen





Season	Location	TEP (µgXeq/L)	TEP number (#/L)*10^7	References
Winter	ALOHA	86-468	-	Prieto et al. (2006)
Winter	St. Barbara Channel	29-252	-	Passow and Alldredge (1995)
Spring	Otsuchi Bay	24-2321	10-34	Ramaiah et al.(2001)
Summer	Ross Sea	0-2800	-	Hong et al. (1997)
Summer	Anvers Island	15-500	-	Passow et al. (1995)
Summer	Monterrey Bay	50-191	-	Passow and Alldredge (1995)
Summer	**off Peru**	**22-1976**	**0.01-400**	**this study**

Table: Comparative data of TEP and TEP:Chl *a* (TEP:Chl *a* fluorescence, this study) for geographic locations in the Pacific Ocean and in the Pacific side of the Southern Ocean.

Summary

- *Phytoplankton* is the major sourse of TEP in the ESTP
- *Remineralisation* of *TEP* contributes substantially to biological *oxygen demand* in the ESTP
- *No covariance* of TEP and oxygen concentrations was determined in the core of the OMZ

Outlook

- For a better understanding of TEP cycling in the ESTP more information on the influence of oxygen on the microbial degradation of TEP is required

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