



Mid-Term Strategic Planning

Initiated by SOLAS SSC in late 2008

Question:

Are there areas of SOLAS science or key scientific questions that:
require a „push“?
and/or
require improved international coordination?

Process:

„White papers“ drafted by SSC members, 2009
→ Community discussion at SOLAS Open Science Conference, Barcelona, 2009

Based on the discussions:

→ Targetted support for **international** workshops, reviews, planning groups.

Goal:

Coordinated, national proposals built on „group awareness“ and with the potential for **international** cooperation, scientific exchange and joint synthesis.

SOLAS Mid-Term Strategic Planning (underway)

Cross-Cutting, Complex Scientific Topics Relevant to SOLAS and Requiring Coordinated, International, Research

Atmospheric control of nutrient cycling and production in the surface ocean

Air-sea gas fluxes at Eastern boundary Upwelling Systems and Oxygen Minimum Zones

Sea ice biogeochemistry and interactions with the atmosphere

Ocean-derived aerosols: production, evolution and impacts

Ship plumes: impacts on atmospheric chemistry and nutrient supply

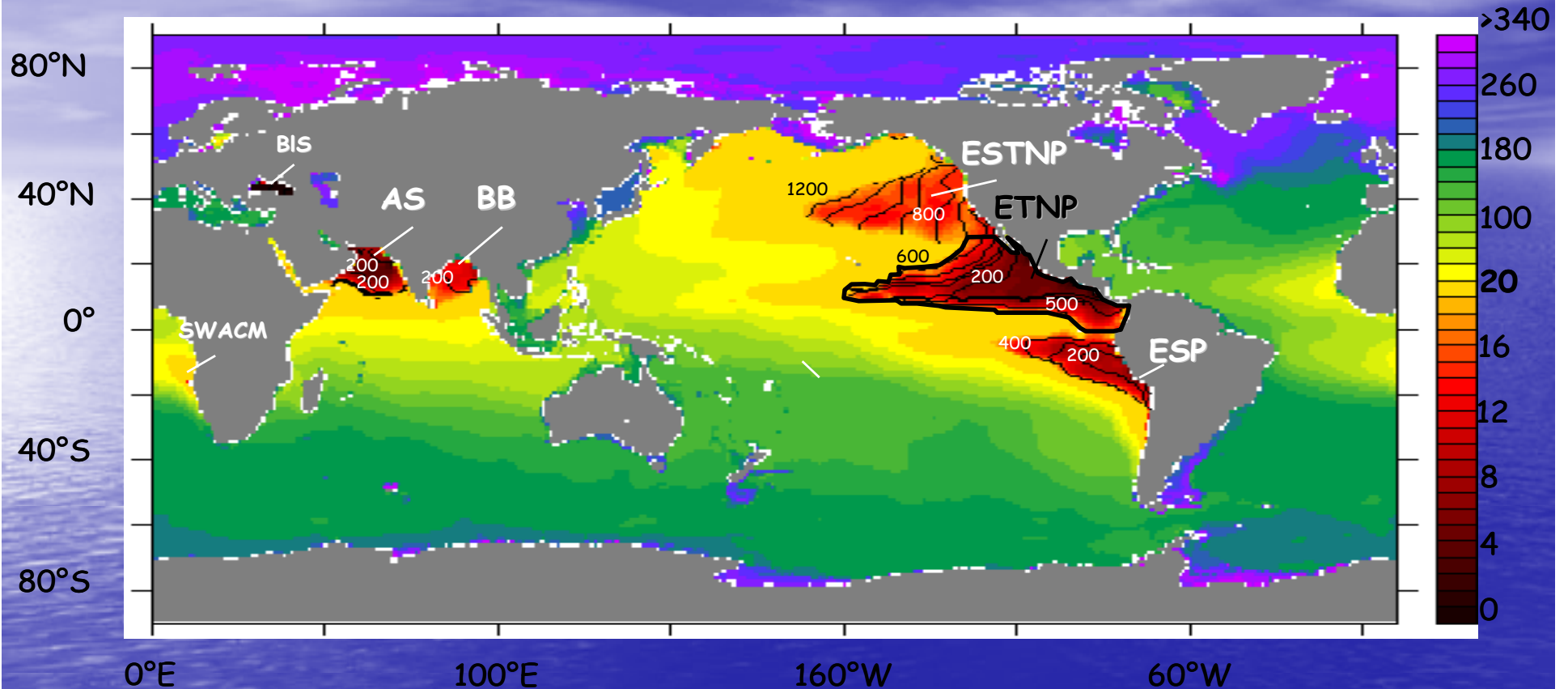
MOIN: the Minimalist OceanSITES Interdisciplinary Network

Large scale experiments for hypothesis testing

Air-sea fluxes at Eastern Boundary Upwelling and OMZs systems

Aurélien Paulmier and Véronique Garçon
LEGOS, Toulouse, France

The OMZs

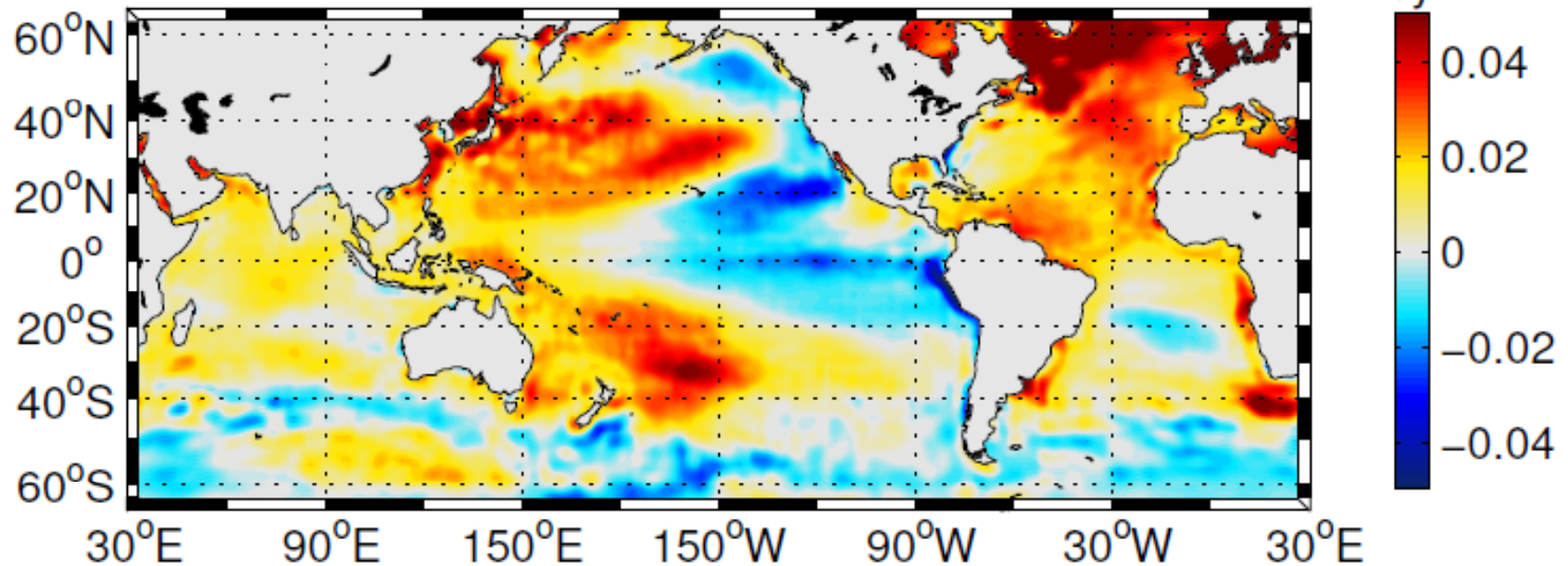


Paulmier and Ruiz-Pino, 2008 (*Progr. Oceanogr.*)

O₂ distribution at depth where O₂ concentrations are minimal (WOA 2005)

Eastern Pacific (and OMZ) cooling recently

b) Linear trend SST anomalies (Nov 1981 to Mar 2009) °C/yr

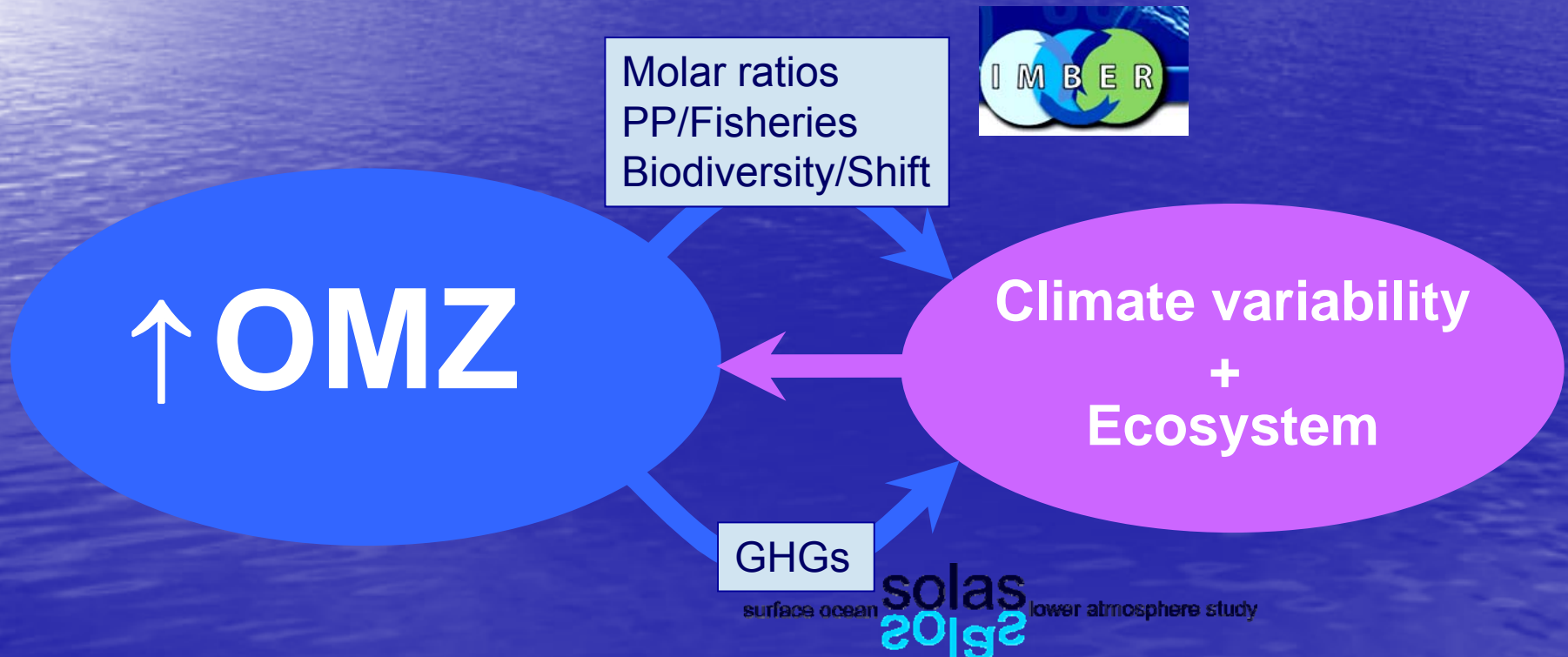


Adding to lower oxygen ...

Impacts

Perturbations of biogeochemical cycles and remineralization:

- O₂ loss
- Loss versus fixation of N
- Recycling versus sequestration of C
- Production/accumulation of N₂O, CH₄, H₂S, halogeneous and reduced metals (Fe, Cu)
- Consumption versus production of DMS
- Acidification



Key Questions

- What are the short and long-term influences of the EBUS-OMZs on climate change, including the impact of the greenhouse gases, clouds formation, and control of O_3 and O_2 ?
- What are the mechanisms that drive degradation of organic matter (including CDOM) for the production of GHGs, e.g. the switch from an aerobic (O_2 -respiration) to an anaerobic (via NO_3 , SO_4 , metanogenesis, IO_3 , Fe) remineralization?

ABOUT SOLAS

What is SOLAS?

Organisation+ Structure

- Scientific Steering Committee (SSC)
- Science Plan+ Implementation Strategy (SP+IS)
 - Mid-Term Strategy
 - OMZ meeting
- Task Teams
- Implementation Groups
- SOLAS Networks
- SOLAS IPO

Sponsors

Partner projects

People

Opportunities

You are here: Home > About SOLAS > Organisation and Structure > Mid-Term Strategy > OMZ meeting

Mid-Term Strategy meeting: Air-Sea Gas Fluxes in Eastern Boundary Upwelling Systems and Oxygen Minimum Zones (OMZs)

8-10 November 2010
Lima, Peru



Background

Among the new initiatives approved by the [SOLAS Scientific Steering Committee](#), the theme of air-sea exchange of short- and long-term radiatively-active gases in the Eastern Boundary Upwelling Systems (EBUS) and Oxygen Minimum Zones (OMZs) has been discussed during the [SOLAS Open Science Conference](#) in Barcelona (November 2009).

This initiative focuses on the co-existence of specific mechanisms, which are inducing a perturbation of biogeochemical cycles (for instance nitrogen loss, acidification) and acting as an "engine" producing and/or consuming climatic gases: O₂, CO₂, N₂O, CH₄, halogenous compounds. The scientific issues are:

- 1) Which is the complete influence of the OMZs-EBUS on climate change, taking into account the impact of the greenhouse gases, cloud formation and control of O₃ and O₂?
- 2) Which are the responsible mechanisms associated with a bio-, photo-, or chemo-degradation of organic matter (including CDOM) for the production of greenhouse gases, e.g. the switch from an aerobic (O₂-respiration) to an anaerobic (via NO₃, SO₄, metanogenesis, IO₃, Fe) remineralization?

In order to answer these questions in the tropical OMZs-EBUS, the initiative focuses on the eastern tropical Pacific, which corresponds to the largest OMZ.

The workshop, including one day of short presentations and one day and a half for discussion, aims to stimulate an experimental oceanic and atmospheric effort, coordinated at the international scale from 2011-2012.

Organising committee

Veronique Garcon	LEGOS/CNRS, Toulouse, France SOLAS Scientific Steering Committee	veronique.garcon@legos.obs-mip.fr
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Meeting information

The meeting will take place at the [Instituto del Mar del Peru \(IMARPE\)](#) in Lima, Peru, from 8 to 10 November 2010.

[Download information on meeting venue](#)

Scientific Committee :

Arnaud BERTRAND (LMI DISCOH, IRD, Peru)

Francisco CHAVEZ (MBARI, USA)

Véronique GARCON (LEGOS/CNRS, SOLAS SSC, France)

Michelle GRACO (IMARPE, Peru)

Dimitri GUTIERREZ (IMARPE, Peru)

Aurélien PAULMIER (LEGOS/IRD, France/Peru)

Elisabeth SILVESTRE (SENAMHI, Peru)

Ken TAKAHASHI (IGP: Instituto de Geofisica de Peru, Peru)

Rainer VOLKAMER (University of Colorado, CIRES, USA)

Doug WALLACE (IFM-GEOMAR, Chairman International SOLAS, Germany)

DAY ONE

INTRODUCTION

9h15-9h30: Welcome IMARPE (Renato Guevarra). Introduction SOLAS (Doug Wallace) and workshop (Véronique Garçon)

FOCUS 2: Exchange across the air-sea interface

9h30-9h45: Brian Ward

9h45-10h00: Phil Nightingdale

10h00-10h15: Ralph Keeling

FOCUS 3: Long-lived radioactively active gases

10h15-10h30: Carol Robinson

10h30-10h45: Laura Farias

10h45-11h00: Arne Körtzinger

Coffee break

FOCUS 1: BCG interactions between the ocean and the atmosphere

11h30-11h45: Bill Miller

11h45-12h00: Rafel Simo

12h00-12h15: Peter Croot

12h15-12h30: Roland Von Glasow

12h30-12h45: Trish Quinn

12h45-13h00: Rainer Volkamer

Lunch

FOCUS 2: Transport and transformation in the oceanic boundary layer

15h00-15h15: Francisco Chavez

15h15-15h30: Hervé Claustre

15h30-15h45: Martin Hernandez

15h45-16h00: Peter Revbesch

16h00-16h15: Michelle Graco

Coffee break

16h45-17h00: Marcel Kuypers

17h00-17h15: Christian Tamburini / Christos Panagiotopoulos

17h15-17h30: Aurélien Paulmier

17h30-17h45: Niki Gruber

17h45-18h00: Planning for DAY TWO

DAY TWO

LINK SOLAS-PALEO: Surface ocean lower atmosphere interactions in the past

9h 15-9h30 : Dimitri Guterriez

9h30-9h45 : Abdel Siffedine

9h45-10h00 : David Field

10h00- 10h15 : Isabel Cacho

10h15- 10h30 : Philippe Martinez

10h30-10h45 : Jorge Valdez

Coffee break

11h15-13h00: Splitting in working groups :

WG 1: FOCUS 1

WG 2: FOCUS 2

WG 3: FOCUS 3

WG4: Paleoceanography

Identification of the key questions to be addressed for each Working group

Lunch

15h00-18h00: All afternoon: Working groups Sessions

Writing of future common plan along with timetable for international cruises and experiments in the OMZ of the East tropical Pacific

Meeting Dinner in Barranco.

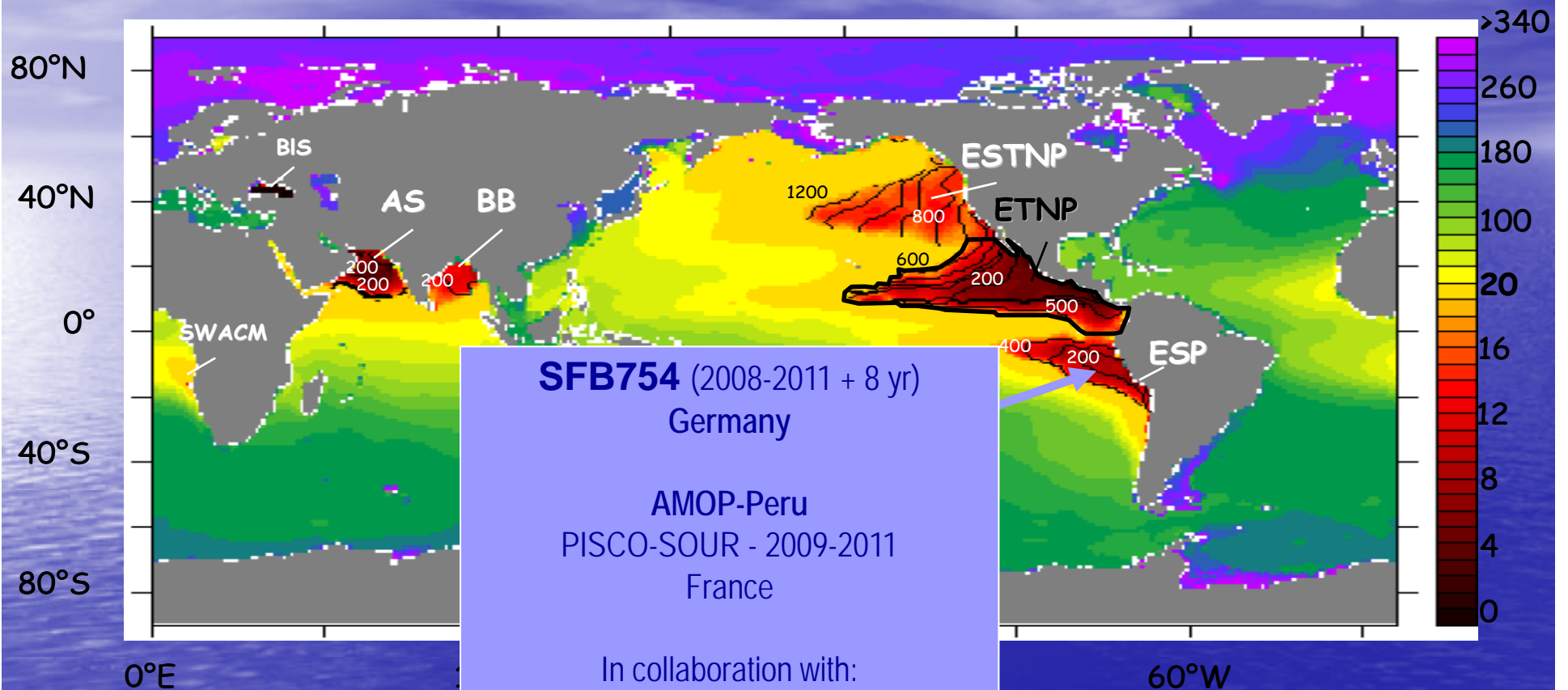
DAY THREE

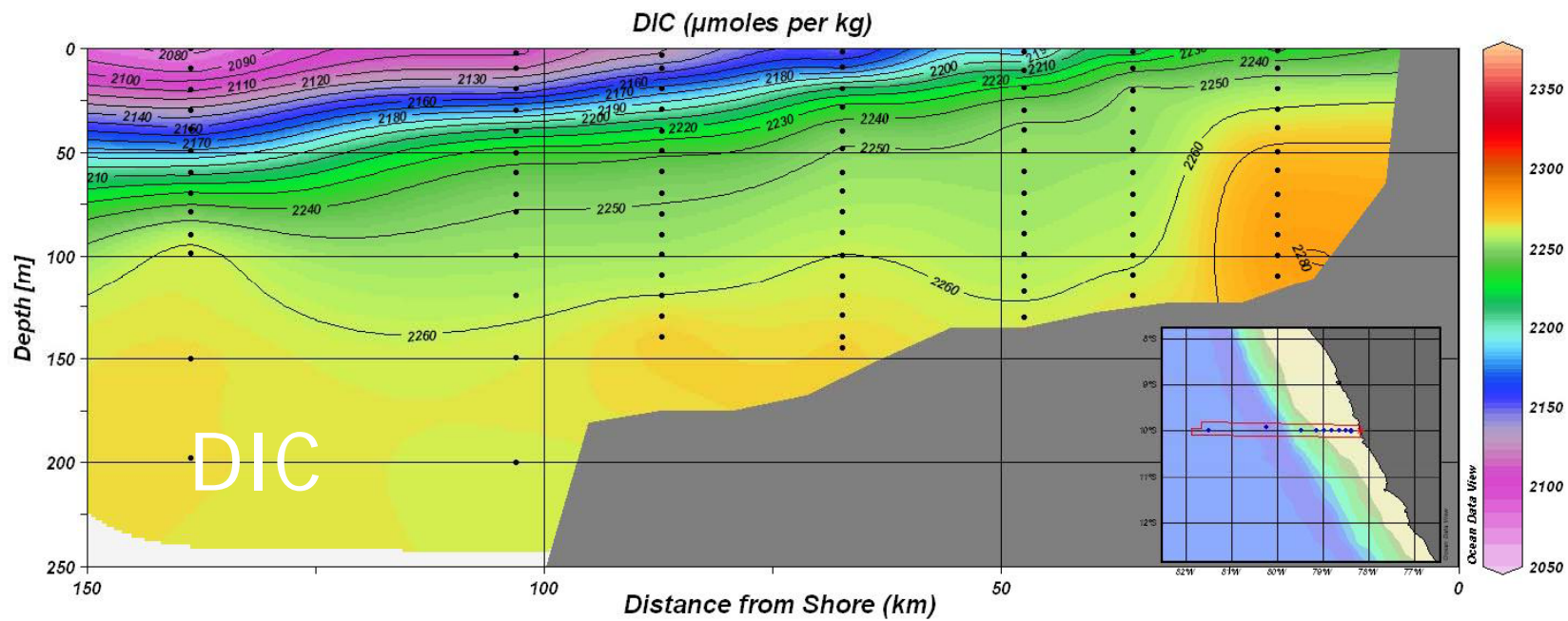
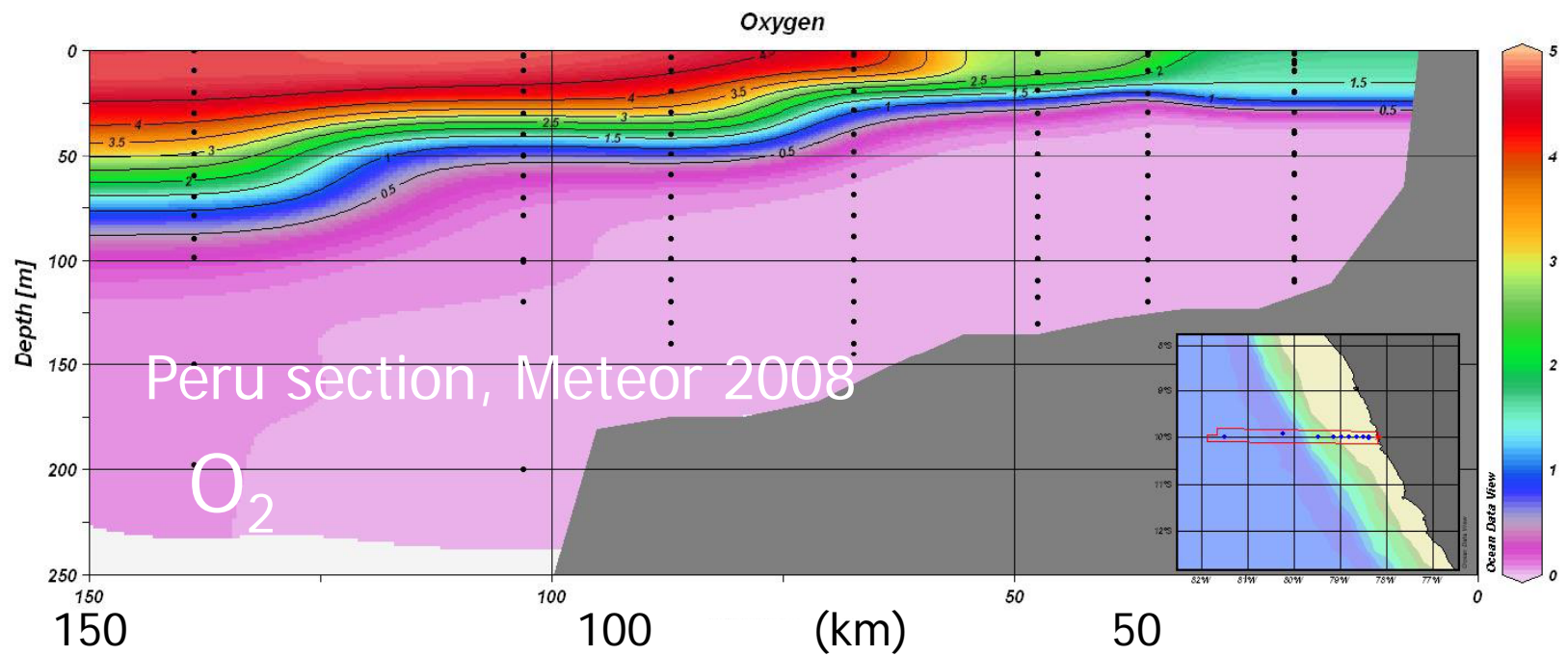
Working group reports and future planning

Closure of workshop

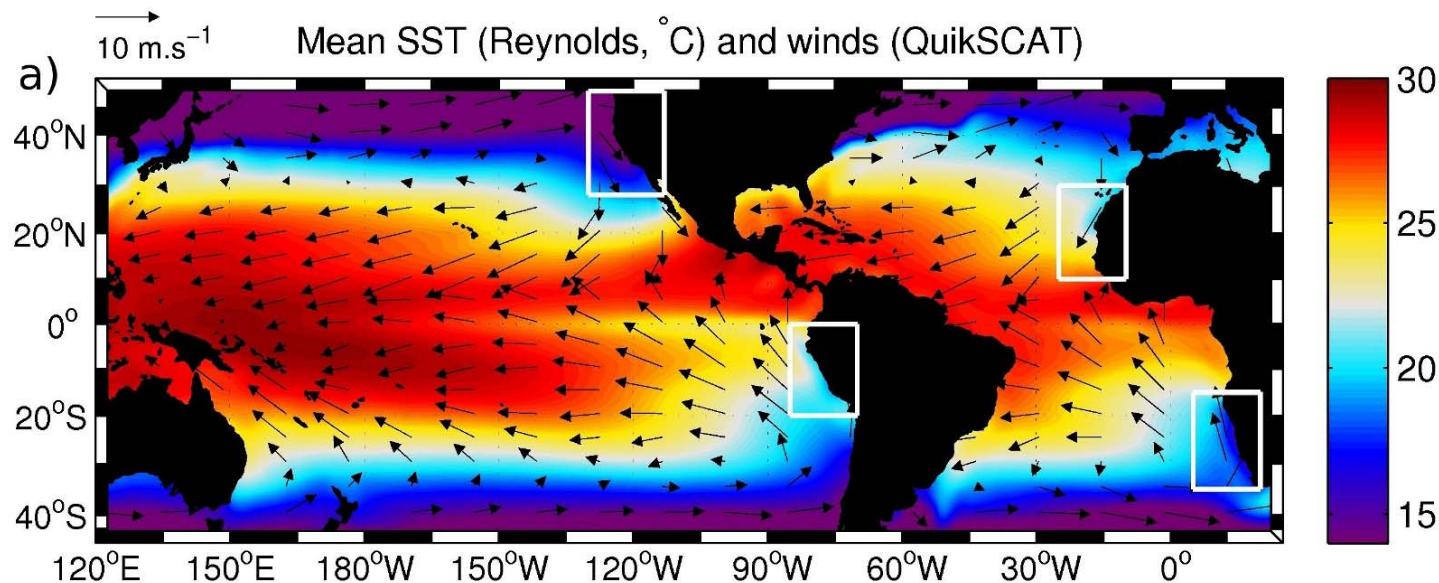
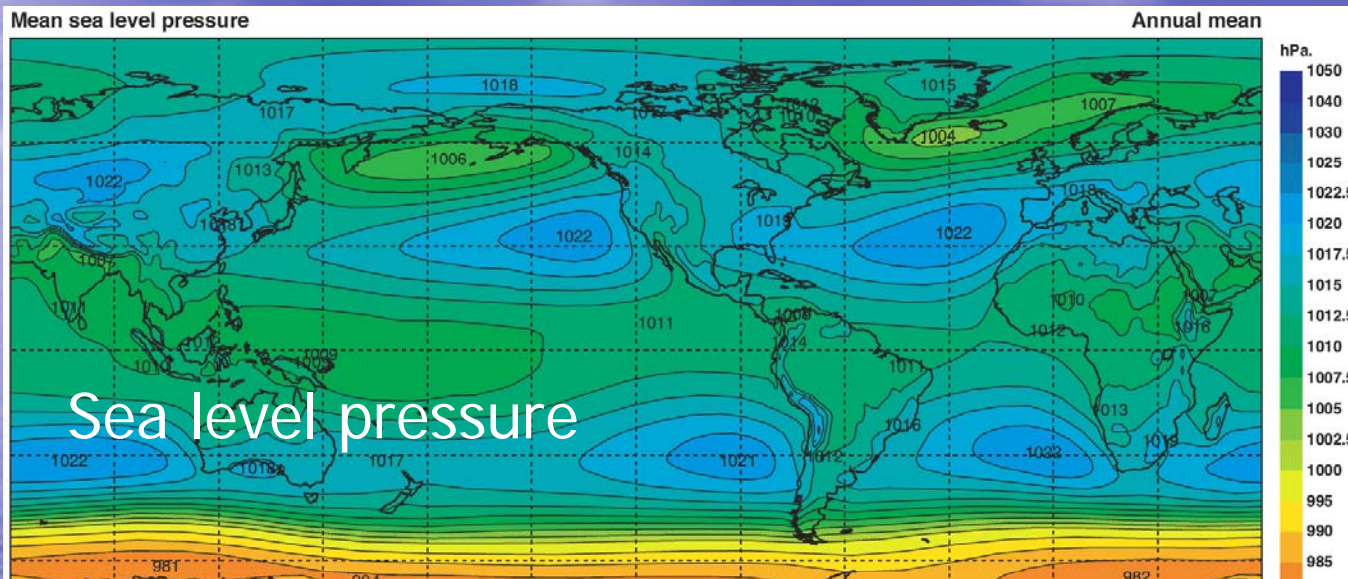
Lunch

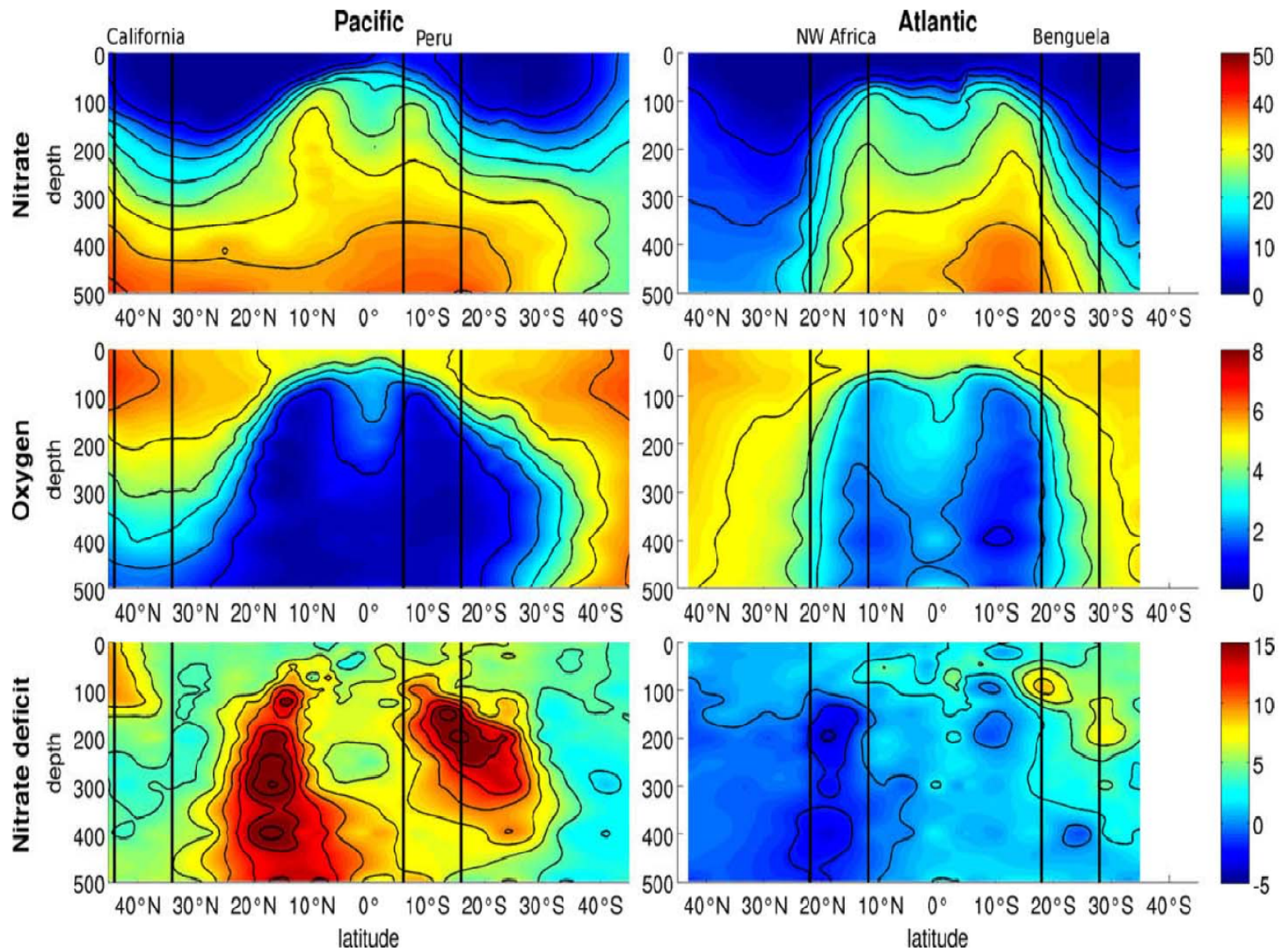
International Interactions and Opportunities





Coastal upwelling ecosystems susceptible to changes in climate, offer large gradients



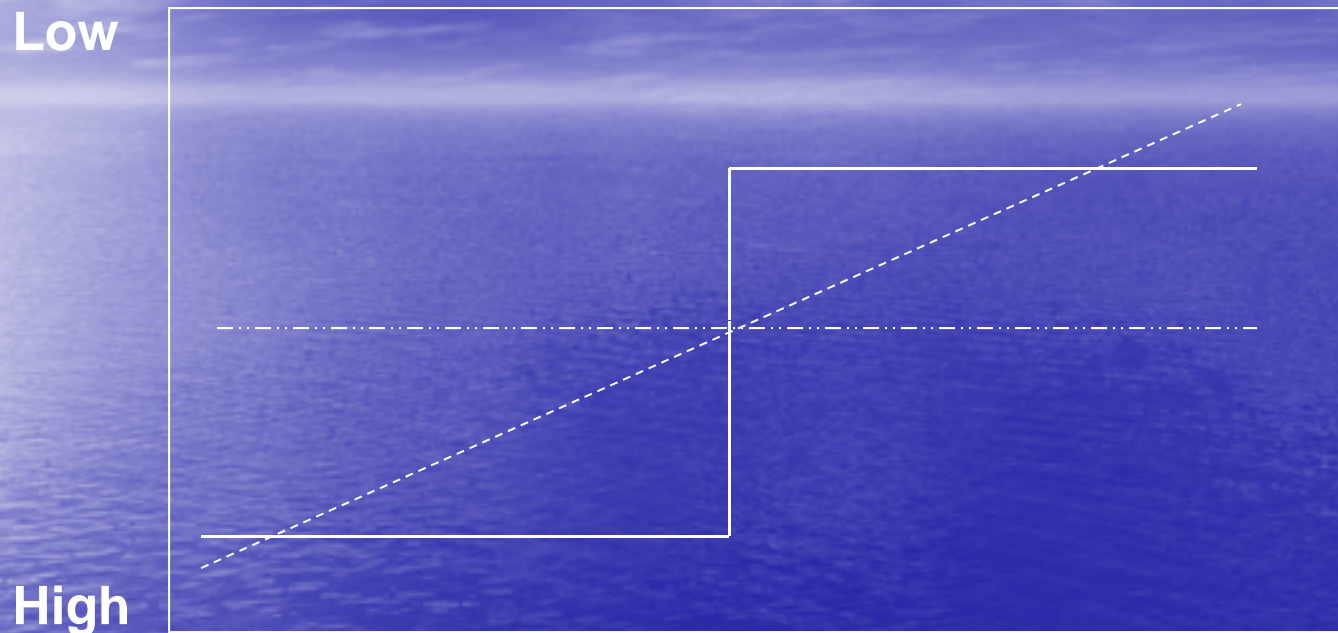


Chavez and Messie, 2009, Progress in Oceanography

EBUEs

- Clear differences among major systems in terms of fluxes
- Clear latitudinal differences within each system
- Provides the context for well-defined experiments to use gradients in the environment to answer important scientific questions

Possible solutions for the impact of a “property” on air-sea flux of CO₂ for example



Oxygen, pH or latitude

Peru

Chile

Baja California

Alta California

NW Africa

Iberia

Namibia

Benguela