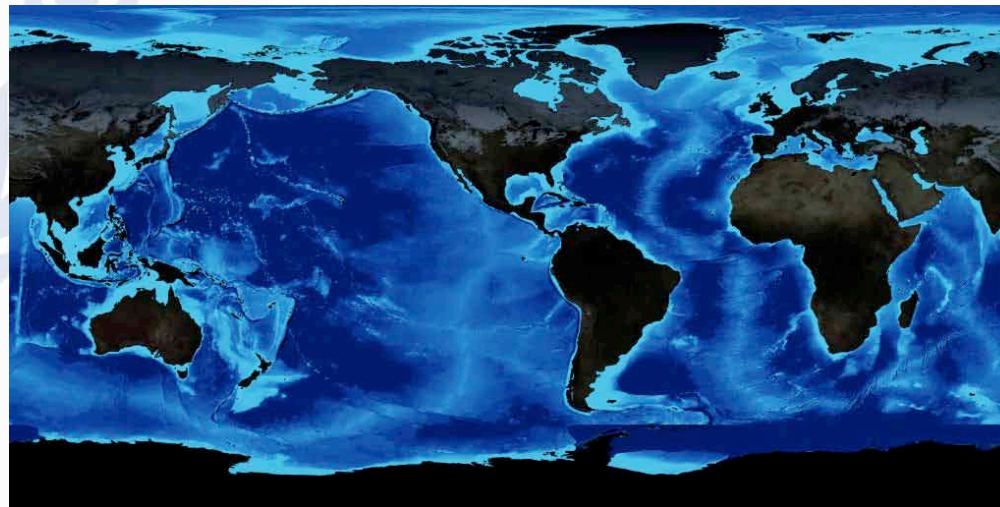


Theme Leader

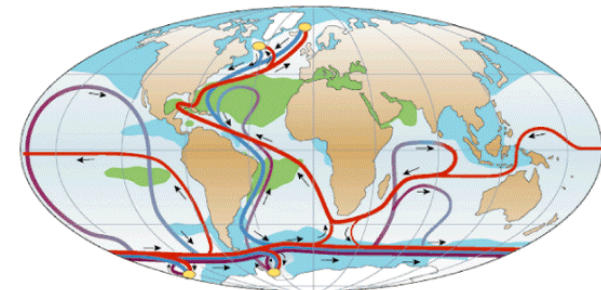
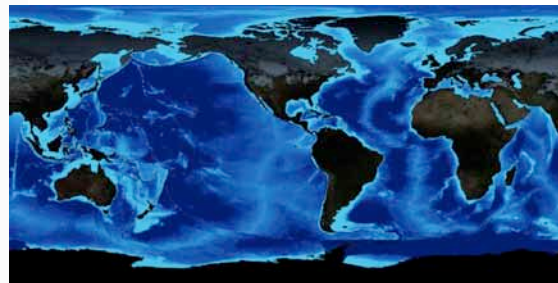
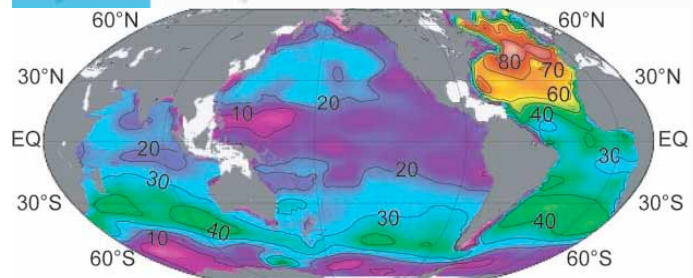
PROF. DR. MARTIN VISBECK
IFM-GEOMAR, Kiel Germany



Climate in Oceans and Coasts

300 Word Summary Statement from the Session

The ocean covers two thirds of the planet, and hosts the largest biosphere on earth. It plays a dominant role in the global climate system through the transport and storage of heat, water, nutrients and other climate variables such as carbon. The ocean mitigates surface warming through the absorption of heat and greenhouse gases. It provides important living and non-living resources and other ecosystem services for humans. It contributes to the global economy, trade and food and to national security. It impacts on society are particular strong within 100 km of the coastline where 40% of the world population lives and ecosystem goods and services are most concentrated.



Climate in Oceans and Coasts

Climate change on time scales from decades to centuries has profound consequences for the marine, coastal and littoral environments with potentially devastating effects through:

- (1) rising **sea level**,
- (2) increasing **heat content**,
- (3) increasing **sea surface temperature**,
- (4) changes in strength and spatial distribution of the **hydrological cycle**, and
- (5) **ocean acidification** and
- (6) **ocean deoxygenation**. Together these effects lead to (7) changes in the **distribution and abundance of marine life**, altered **food webs** and changed **biodiversity** in marine ecosystems.

Climate in Oceans and Coasts

Strategies and governance frameworks for risk management and adaptation responding to these changes need to be developed. This includes coastal defense strategies to cope with sea level rise and storm surge rises; and responsive fisheries management, which rebuilds ecosystem resilience.

The implementation of such strategies is critically dependent on climate, ocean and coastal observing, information and prediction systems.

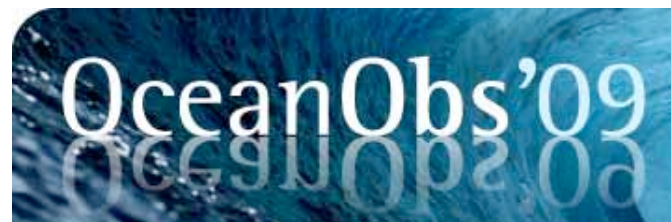
The global and coastal ocean experts at the Conference expressed strong support for the following key recommendations:

- 1) A comprehensive ocean observing system should be a major part of the Global Framework for Climate Services.**
- 2) Coastal and global ocean research needs to be an integral part.**
- 3) Assessments of ocean climate and marine ecosystems.**
- 4) Ocean climate prediction.**
- 5) Capacity building.**

The global and coastal ocean experts at the Conference expressed strong support for the following key recommendations:

1) A comprehensive ocean observing system should be a major part of the Global Framework for Climate Services.

The Global Ocean Observing System (GOOS, GCOS, ...) should be fully implemented in the open ocean and coasts, and further enhanced to include biogeochemical and ecosystem parameters, in line with international agreements and conventions (e.g. UNFCCC, GCOS, CBD). Such an observing system should be informed by the recommendations from the OCEANOBS'09 Conference;



The global and coastal ocean experts at the Conference expressed strong support for the following key recommendations:

2) Coastal and global ocean research needs to be an integral part.

National and international research should be strengthened to improve our understanding of ocean processes on global, regional and local scales. Including a better understanding of ocean-atmosphere interactions, and the role of the ocean in predicting climate change on time scales from seasons to millennia. Quantification of the impact and interaction between climate and ecosystems. And particularly the connection between changes in the open ocean and their impacts on coastal systems need to be understood.

The global and coastal ocean experts at the Conference expressed strong support for the following key recommendations:

3) Assessments of ocean climate and marine ecosystems.

Sustained and timely operational assessments of the physical, biochemical and ecosystem states of the oceans should be implemented;

4) Ocean climate prediction.

Operational systems should be developed and implemented for predicting changes in the ocean climate system on time scales of days to decades, including the development of 'operational marine ecology'

The global and coastal ocean experts at the Conference expressed strong support for the following key recommendations:

5) Capacity building.

Developing nations and economies in transition need to be supported to develop national capabilities that contribute to and benefit from ocean observations, research, information, assessment and prediction. A particular need is to locally develop the capability to take ocean observations interpret their information and thus provide knowledge for local decision making in support of creating sustainable ecosystem goods and services for their own social and economic benefit.



The global and coastal ocean experts at the Conference expressed strong support for the following key recommendations:

- 1) A comprehensive ocean observing system should be a major part of the Global Framework for Climate Services.**
- 2) Coastal and global ocean research needs to be an integral part.**
- 3) Assessments of ocean climate and marine ecosystems.**
- 4) Ocean climate prediction.**
- 5) Capacity building.**