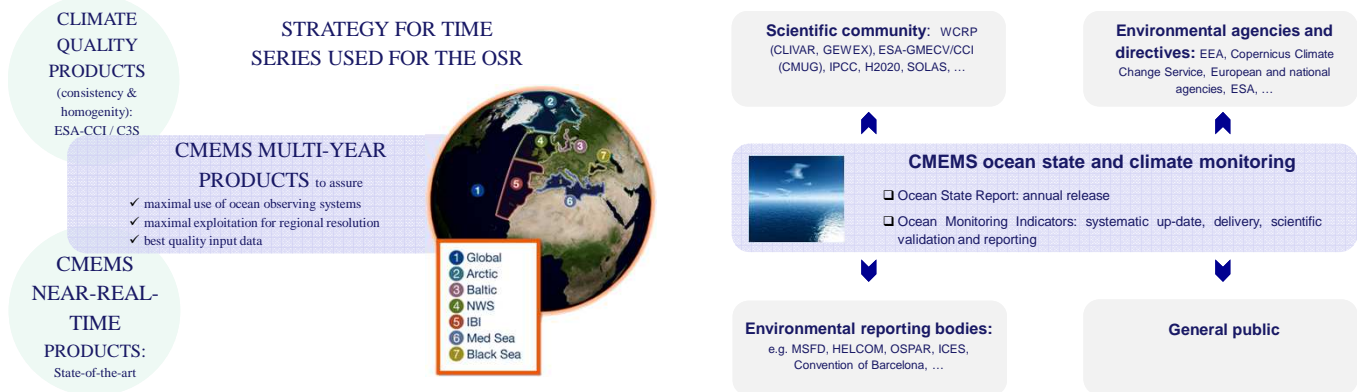


Knowledge of the oceans is of critical importance; they cover 71% of our planet, have a fundamental role on our weather, climate and the Earth water cycle and regulate the concentration of gases in the atmosphere and the cycling of nutrients. They provide important food and energy resources and largely contribute to economic wealth. State-of-the-art understanding and monitoring of our marine environment is vital for a better and sustainable management of the oceans and is becoming ever more important in an economically and geopolitically connected world. The Copernicus Marine Environment Monitoring Service (CMEMS) provides new marine data sets based on observations and models which allow to study the oceans with a more integrated and dynamic approach. Science, in turn, provides the knowledge necessary to forecasting, managing risks and open resources, adapting to the impacts of climate change. This survey provides guidance on Essential Ocean Variables (EOV), large scale ocean changes and specific events over the period 1993-2015, with an additional particular focus on variations during the last year. This first CMEMS Ocean State Report is an important step forward into the development of comprehensive and regular reporting of the state and health of the global ocean and European seas based on CMEMS unique marine environment monitoring capabilities.



## STRUCTURATION

### CHAPTER 1: ESSENTIAL OCEAN VARIABLES

- 1.1 Sea surface temperature
- 1.2 Subsurface temperature
- 1.3 Surface and subsurface salinity
- 1.4 Sea Level
- 1.5 Ocean colour CHL-a
- 1.6 Currents
- 1.7 Sea Ice
- 1.8 Carbon
- 1.9 Oxygen

### CHAPTER 2: LARGE-SCALE CHANGES

- 2.1 Ocean heat content
- 2.2 Ocean mass and heat transport
- 2.3 The Atlantic meridional overturning
- 2.4 Mesoscale activity
- 2.5 European Seas
  - 2.5.1 Mediterranean Sea
  - 2.5.2 North-West-Shelf
  - 2.5.3 Arctic Ocean
  - 2.5.4 Baltic Sea
  - 2.5.5 Iberian-Biscay-Irish Sea

### CHAPTER 3: SPECIFIC EVENTS

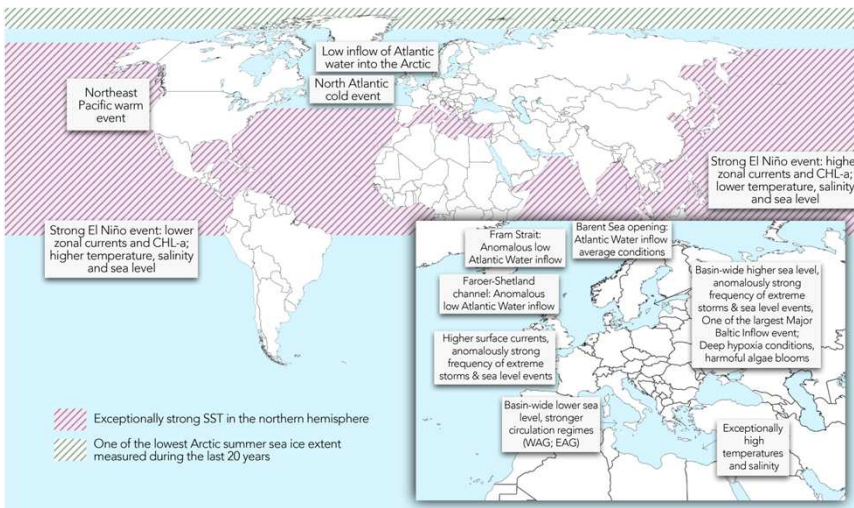
- 4.1 The 2015 El Niño event
- 4.2 The 2015 North Atlantic cooling event
- 4.3 Harmful algae blooms in the Baltic Sea
- 4.4 Extreme sea level events

**About 80 European scientific experts currently contribute to the CMEMS OSR**

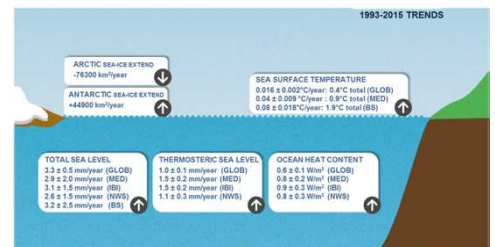


## KEY MESSAGES

### SPECIFIC CHARACTERISTICS DURING THE YEAR 2015



### MONITORED CHANGES DURING 1993-2015



The Copernicus Marine Environment Monitoring Service provides a wide range of quality assessed observational and model data for the global ocean and European seas. The current state of the ocean and changes along the recent decades is the fundamental information we have extracted from these unique CMEMS data sets and products, which are synthesized in this ocean state report. This first CMEMS OSR builds the fundamental basis for CMEMS Ocean Monitoring Indicators aiming to allow a regular monitoring of the ocean state, variability and change at global and European scales.

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