Environment & Ecology · GS - III

Explain the significance of dissolved oxygen in maintaining marine ecosystem health. Discuss the major factors affecting ocean oxygen levels and their implications for marine biodiversity.

EXAM YEAR	PAPER	SUBJECT
DAILY PRACTICE 10/11/2026	GS - III	Environment & Ecology

MARKS	WORD LIMIT
10	~150 words

Answer Hint

Dissolved oxygen, marine respiration, phytoplankton, ocean warming, ocean deoxygenation, eutrophication, ocean circulation, marine biodiversity, climate change.

Model Answer

Introduction

Dissolved oxygen is essential for the survival of most marine organisms. Its availability influences marine biodiversity, food webs and ecosystem productivity.

Factors Affecting Ocean Oxygen Levels

1. **Temperature:** Warmer seawater generally holds less dissolved oxygen.
2. **Photosynthesis:** Phytoplankton and marine plants release oxygen through photosynthesis.
3. **Ocean circulation:** Currents and vertical mixing transport oxygen to different ocean depths.
4. **Eutrophication:** Excess nutrients can cause algal blooms, whose decomposition depletes oxygen.
5. **Climate change:** Warming and changes in ocean circulation can intensify marine deoxygenation.

Ecological Implications

Low oxygen levels can cause hypoxia, fish mortality, habitat loss and changes in species distribution. Oxygen availability also affects nutrient cycling and marine food chains.

Way Forward

Long-term ocean monitoring, reduction of nutrient pollution, climate mitigation and protection of marine ecosystems are essential.

Conclusion

Maintaining healthy ocean oxygen levels is crucial for marine biodiversity and the resilience of global ocean ecosystems.

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