

# IPW LECTURES

## Climate Change and the Deep Sea: Science-Policy perspectives

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### Abstract

The deep ocean (>200 m) plays a critical role in climate mitigation, removing heat and CO<sub>2</sub> from the atmosphere. This function also causes warming, acidification, deoxygenation and changing food supply in deep waters. These stressors interact with each other and with other ocean parameters such as light and nutrients to modify ocean life. The consequences for deep-sea marine ecosystems and their ecological functions and services are likely to be substantial. These may include redistribution and habitat compression of species including some with commercial value or trophic significance, loss of habitat and support values via effects on foundation species, changes in biodiversity, altered food web structure and more. Proposed ocean-based climate interventions may compound or exacerbate these threats. These changes will also intersect with physical, chemical and biological disturbance imposed by increasingly deeper extraction of oil and gas, living resources and seabed minerals, affecting carbon services, ocean resilience and sustainability. I will discuss critical scientific knowledge required for maintaining ocean sustainability and how these challenges are treated (or not) in global assessments. Major opportunities for mainstreaming climate resilience and carbon conservation in ocean management and international policy instruments will be highlighted.



Lisa Levin is a Distinguished Professor Emerita at the Scripps Institution of Oceanography, University of California, San Diego. She served as Director of the Center for Marine Biodiversity and Conservation and Oliver Chair at Scripps from 2011-2017. Levin's research interests include biodiversity and climate change impacts on deep-sea continental margin, and the application of deep-sea science to policy. Levin's deep-sea research has been conducted on over 50 expeditions to the margins of the Pacific, Indian and Atlantic Oceans using ships, submersibles, ROVs and AUVs to observe, sample and conduct experiments. Dr. Levin is co-founder and co-lead of the Deep-Ocean Stewardship Initiative (DOSI) and the Deep Ocean Observing Strategy (DOOS) and contributes to IPCC reports and World Ocean Assessments.