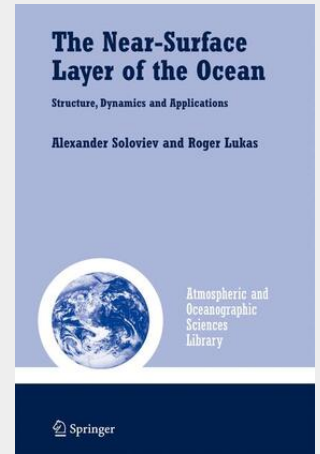


# The Near-Surface Layer of the Ocean

Structure, Dynamics and Applications

Until the 1980s, a tacit agreement among many physical oceanographers was that nothing deserving attention could be found in the upper few meters of the ocean. The lack of adequate knowledge about the near-surface layer of the ocean was mainly due to the fact that the widely used oceanographic instruments (such as bathythermographs, CTDs, current meters, etc.) were practically useless in the upper few meters of the ocean. Interest in the near-surface layer of the ocean rapidly increased along with the development of remote sensing techniques. The interpretation of ocean surface signals sensed from satellites demanded thorough knowledge of upper ocean processes and their connection to the ocean interior. Despite its accessibility to the investigator, the near-surface layer of the ocean is not a simple subject of experimental study. Random, sometimes huge, vertical motions of the ocean surface due to surface waves are a serious complication for collecting quality data close to the ocean surface. The supposedly minor problem of avoiding disturbances from ships' wakes has frustrated several generations of oceanographers attempting to take reliable data from the upper few meters of the ocean. Important practical applications nevertheless demanded action, and as a result several pioneering works in the 1970s and 1980s laid the foundation for the new subject of oceanography – the near-surface layer of the ocean.

The Near-Surface Layer of the Ocean provides a comprehensive account of the structure and dynamics of this important component of the ocean. The book develops the relevant physics and thermodynamics in depth. Detailed treatment is given to the surface microlayer, upper-ocean turbulence, fine thermohaline structure, coherent structures, high wind-speed regime, and to practical applications. Results of major air-sea interaction experiments (including those obtained with the participation of the authors) are used in the analysis.



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