

海洋觀測的現況與未來

Ocean Observation: Present and Future

鄧中柱

Chung-Chu Teng

Oceanographers and meteorologists require a lot of ocean observations to achieve their aims of understanding and predicting the properties and dynamics of the ocean and the atmosphere. Although models and simulations can be powerful tools to study and predict oceanic and atmospheric processes of interest, observations are continually required to better understand, prove, validate, supplement, and enhance the latest environmental models. More importantly, long-term ocean measurements and information collected across the world oceans (both coastal and offshore) directly provide essential and crucial support to the coastal/ocean planning and policy-making, marine and coastal recreation, design and construction of coastal and offshore structures, safe and economic marine operations, monitoring and studying of coastal processes, safe navigation and sea transportation, monitoring and responses to marine emergency or disasters, monitoring and control of marine environments, marine environmental modeling and forecast, oceanic and atmospheric studies, etc. Ocean observing systems can measure and report a wide variety of oceanographic and meteorological parameters, such as wind speed, wind direction, atmospheric pressure, air temperature, water temperature, ocean waves, ocean currents, tide and water level, precipitation, visibility, solar radiation, conductivity, turbidity, dissolved oxygen, pH, and chlorophyll.

In this presentation, ocean observing technologies and systems are briefly reviewed with some current status (Present) and what could and will happen later (Future). Several existing observing systems and networks are used to illustrate the importance and effects of “integrated ocean observing systems” and “observing networks”. Then, the importance of turning ocean observations into useful ocean products and services for various users and stakeholders is presented and discussed. In addition, most of the ocean observing systems and technologies are originated from research projects or programs. Transitioning from research to operations, which is necessary and critical to ensure the sustainability and reliability of long-term ocean observations, is also discussed.