Oct 17th, 9:30 AM - 9:45 AM

Ocean Waves Workshop 2019 Session 1 Notes

Kaus Raghukumar
Integral Consulting Inc., Santa Cruz, CA

Sam McWilliams
Integral Consulting Inc., Santa Cruz, CA

Session 1 – Waves: An Important Component of Operational Oceanography

Rapporteurs: [1]Kaus Raghukumar, Ph.D., and [1]Sam McWilliams, E.I.T.
[1]Integral Consulting

Operational organizations collect and use long-term oceanographic measurements of the oceans and atmosphere, and provide rapid interpretation and dissemination of information to provide environmental intelligence.

Raw data are different from information that can be used to support operations. Observations such as wave heights and wave lengths are less useful than reporting a parameter such as wave steepness.

The quality of products such as forecasts and warnings that are provided to operators are only as good as the data that support product developers. Environmental databases are known to have inaccuracies and data gaps.

Quality control of observations provides confidence in resulting information. Data standards help to ensure that data are held to consistent and commonly understood quality assurance, facilitate data sharing, and ultimately provide more accurate forecasts, enable the management and study of ocean phenomena such as sea, swell, surf, and surges.

Important products derived from operational oceanography are nowcasts, forecasts, and hindcasts. Wave data are essential to determine statistical extremes.

Ocean observatories contribute to increasing flows of data. Integrating observations between disciplines over spatial scales from local to global presents challenges.

Observations are sparse in the nearshore and open ocean regions. New *in situ* observational tools are needed to measure waves and bathymetric changes from the surf zone to the inner shelf during extreme events.

Remote sensing technologies such as lidar and radar were mentioned. Lidar has been shown to measure aerosols generated by breaking waves in the surf zone. Satellite altimeter data may be used to compute wave height and wind velocity. However, these observations are more representative of trends and climatologies, e.g., mean and maximum heights, which are needed by shipbuilding and offshore structures.

Programs such as the Small Business Innovation Research (SBIR) program might be used to enhance Deep-ocean Assessment and Reporting of Tsunamis (DART®) buoys with measurements to improve understanding of air-sea interactions. There is a network of approximately 39 DART stations.

Programs such as the Small Business Technology Transfer (STTR) might be used to involve small business and academia to redesign NDBC buoy hulls to facilitate applications with unmanned surface vehicles.

The Navy's Task Force Ocean was intended to advance ocean science in the United States while ensuring that the U.S. Navy maintains a competitive advantage in its ability to understand and exploit the ocean environment. The focus of Task Force Ocean was on deep water and acoustics.