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Inter-annual fluctuations of global significant wave height

Yuchun Lin (1), Lie-Yauw Oey (1,2), and Alejandro Förster3 (3)

(1) National Central University, Taiwan (lameixisi@gmail.com), (2) Princeton University, USA (lyooey@ncu.edu.tw), (3) Instituto Mediterráneo de Estudios Avanzados, Spain (aorfila@imedea.uib-csic.es)

This study investigates the inter-annual variations of global significant wave height (SWH) by examining their connection with climate indices. Large-scale climate fluctuations, such as SAM, ENSO, PDO and NAO, change the global weather system and also affect SWH over the global ocean. Here we use 23-year of satellite SWH data and reanalysis wind to understand the trend, seasonal pattern and inter-annual variations for global SWH in different ocean basins. The results show increasing trends of SWH and wind speed over the equatorial Pacific and Atlantic oceans and decreasing trends from middle to higher latitude. The seasonal SWH is general larger in higher latitudes in winter hemisphere where the wind is stronger. The EOF principal components of SWH in different basins indicate inter-annual variations related to climate indices. The EOF eigenvectors of SWH show large amplitudes at higher latitudes of the Pacific and northern Atlantic oceans. There is a significant teleconnection pattern in the Pacific by SAM and ENSO and in the Atlantic by NAO.