S A Hsu, J Marine Sci Res Dev 2014, 4:3
http://dx.doi.org/10.4172/2155-9910.S1.006

OMICS Group Conferences
Accelerating Scientific Discovery

2nd International Conference on
Oceanography
July 21-23, 2014 Hampton Inn Tropicana, Las Vegas, USA

Wind stress over water surfaces: Comparisons of various estimation methods

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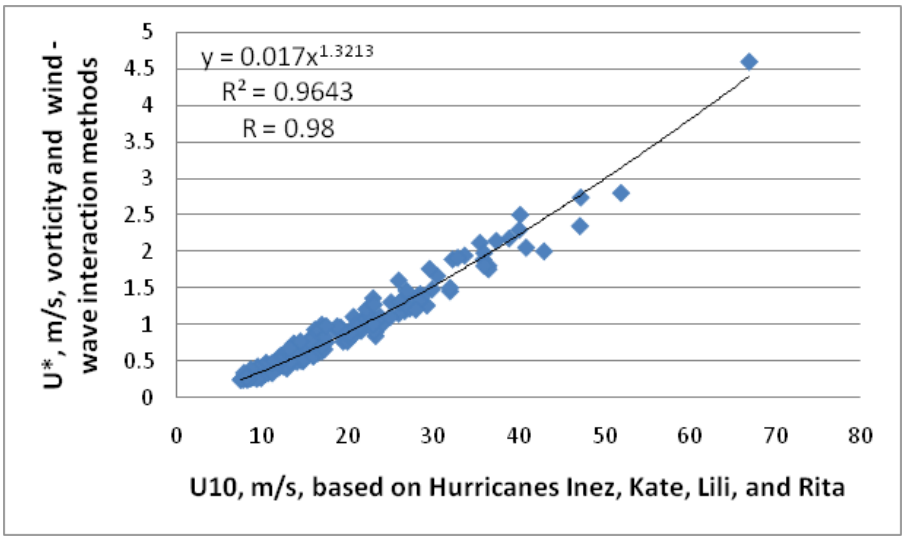
The wind stress over water surfaces is fundamental in air-sea momentum exchanges including wind-wave and wind-current interactions. Various methods to estimate the wind stress, $\tau = \varrho$ U*^2, where U* is the friction velocity, are reviewed and compared. It is found that, after the onset of wave breakers when the wind speed at 10m, U >7.5 m/s, a power law between U* and U works the best for marine meteorology and physical oceanography (met-ocean) applications. As shown below, U*= 0.017U^1.32, where the units are m/s.



Biography

S A Hsu is Professor of Oceanography and Coastal Sciences (Emeritus), Louisiana State University (LSU) since 1969 after he completed his PhD in Atmospheric Sciences (specializing in the physics of air-sea-land interaction and engineering hydrometeorology), Department of Civil and Environmental Engineering, The University of Texas.He published world-first textbook entitled "*Coastal Meteorology*" by Academic Press in 1988 and over 120 articles in refereed journals, encyclopedias, and book chapters in the fields of coastal and marine meteorology, air-pollution meteorology, air-sea interaction, and hydro- and engineering meteorology. He is a Certified Consulting Meteorologist (certified by American Meteorological Society in 1979) for numerous corporations and law firms. He is also the Co-Editor-in-Chief for "The Open Ocean Engineering Journal.

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