



## **What do we know about freaque waves in the ocean and lakes and how do we know it?**

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We made an objective examination of our present state of knowledge on freaque waves in the ocean and lakes from three separate perspectives:

- a. testimonial – from eyewitness account of actual encounters;
- b. empirical – from available in-situ wave measurements;
- c. conjectural – from academic theoretical formulations;

and led to a subjective answer to the posted title question of this paper: we do not know very much about freaque waves in the ocean and lakes! We don't even have a viable definition on the phenomenon.

Other than that academic conjectures are all aimed at theoretically reproducing the empirical case of the 1995 New Year's day freaque wave case at Draupner Platform in the North Sea, there are really no inter-connections among the three perspectives we examined. Put them together however, persuades us to think that freaque waves are really an integrate part of the ocean and lakes, they happen not infrequently but we still basically do not know when, where, how, what, and why they will happen.

It is obvious that in order to expect tangible progress in our knowledge to the understanding of freaque waves in the ocean and lakes, one key ingredient would be to further invigorate the empirical aspect of the perspective, specifically making more in-situ wave measurement for freaque wave studies, which is practically non-existence at the present.

We wish also to construe additionally that the present single-point wave measurement is manifestly inadequate. Rely on single point wave measurements (satellite measurements represent single point in time!) has been the major reason for the lack of significant progress in wave studies in the second half of the 20th century. We propose that 4D spatial wave measurement should be widely used for wind wave studies and for freaque wave studies in particular!