

**ACOUSTICS2008/1923**  
**Models of natural background noise and masking of wind turbine noise**

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Wind turbine (WT) noise limits adjusted to background noise levels are used in several countries among others Britain and France. To determine the background noise level extensive measurements at locations near the proposed WT site are performed. This paper present methods to avoid these measurements in woodland and coastal areas, it also include a pre-study concerning the audibility of WT noise when mixed with background noise.

A prediction model for noise from vegetation is described. This has been coupled to wind field simulations and fluctuations of vegetation noise can therefore be predicted. Measurements and a model for sea wave noise are also presented.

Furthermore the paper present results from psycho acoustic tests with 8 subjects. These involve hearing thresholds and partial loudness when WT noise is mixed with background noise. These are compared to two loudness models. Two different WT sounds have been used as stimuli. The first sound is from a single WT and the second sound is from a WT park. Results show how natural background noises influence the audibility of WT noise and could be used as a tool to optimize the power generated from WTs without causing disturbance among nearby residents.