Mechanical Engineering Grad Seminar
058:191

"Wind-Power Research: Forecasting Wind Resources and Assessing Environmental Impacts"

Presented by

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Abstract: The state of Iowa has taken up the challenge to tap its wind energy resources to contribute to the nation's emerging need for renewable carbon-free and pollution-free energy. Early and successful efforts to supply electrical power from wind within the state have exposed new opportunities for research on ways to more effectively translate power available at the wind farm into power used by consumers. Uncertainty in future wind speeds on scales of hours to decades is an impediment to planning and precludes full use of available resources. We have used ensembles of 52-hour retrospective forecasts, developed by use of six different boundary-layer formulations, to span model variability of wind speed at a height of 80 m. Hub-height measurements of wind speed from the retrospective period are used to assess forecast skill. Bias and mean absolute error as a function of forecast time and ensemble member will be discussed.

Influence of turbine-generated turbulence on crops is being explored by numerical simulation and field observations. A conceptual model of influences on surface budgets of momentum, CO2, moisture, and heat due to enhanced scales of turbulence will be presented, and measurements planned over winter and during the next growing season will be described.

Thursday, October 22
3:30 pm
2217 Seamans Center

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