



Power Systems Engineering Research Center

Contributions of Climate Science to the Electric Power Industry: Forecasting with Lead Times of Hours to Decades

Gene Takle

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PSERC Public Tele-seminar
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Available by Webcast

Description: Variability of weather and climate represents a significant source of risk to the electric power industry. Weather influences power trading, fuel acquisition, load forecasting, systems planning, hazard planning and a range of related tasks within the industry. Lead-times for weather and climate information range from minutes for rapidly changing hazard conditions and wind-power resources to decades for infrastructure planning. Demands on forecast accuracy are equally daunting. A half degree Fahrenheit can mean the difference between normal operation and catastrophic loss of power distribution and transmission due to ice-laden power lines. Similarly, a 1% error in daily wind speed estimates for a 100MW wind generation facility can lead to losses approaching \$12,000,000 over the plant lifetime. Current societal calls for changes in fuel sources will bring additional weather and climate related risks for the electric power industry, particularly for use of biofuels, wind, hydropower, and solar. I will provide an overview of the state of the art in mesoscale weather forecasting and regional climate modeling with applications to the electric power industry, including current efforts to reduce limits to predictability. For short-term prediction I will use wind speed forecasting as an example, and for the longer term I will discuss potential impacts of climate change.

Biography: Gene Takle is professor of Atmospheric Science and Agricultural Meteorology and Director of the ISU Climate Science Initiative. He holds a BA degree in physics and mathematics from Luther College and a Ph. D. in physics from Iowa State University. Takle's research interests include computer modeling of turbulent flow through agricultural shelterbelts, wind power resource assessment and forecasting, and regional climate modeling for studying impacts of global climate change. Recent studies include impact of interannual variability of climate on streamflow and crop production in the US Midwest. He has over 250 scientific papers and presentations and serves as associate editor of two international scientific journals relating to atmospheric science and climate. His research is funded by the National Science Foundation,

the Department of Energy, USDA, and the National Oceanic and Atmospheric Administration. He has been a Certified Consulting Meteorologist since 1984. Takle serves on numerous national scientific review panels and recently has been appointed Commissioner for Education and Human Resources of the American Meteorological Society. He served as contributing author and reviewer of the Third and Fourth Assessment Reports of the Intergovernmental Panel on Climate Change, a co-recipient of the 2007 Nobel Peace Prize.

Speaker Contact Information

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Participation by Webcast: You can participate in PSERC tele-seminars via webcast. Before the tele-seminar, [click here](#) and then on 3/3/09 when the status is "In Progress." Note that the web page at that address does not automatically refresh. The webcast will include the audio and the slides so you will not have to download the slides in advance. If you want to ask questions, you should register for participation by phone.

Registration for Webcast Participation: None required. There is no charge for participating!

Tele-Seminar Logistics and Assistance

If you have any questions, please contact Theresa Herr, PSERC's administrative assistant, at 480-965-1643 or Theresa.Herr@asu.edu. You can also contact Dennis Ray, PSERC Executive Director, at 608-265-3808 or djray@engr.wisc.edu.

Professional Development Hour Certification: PDH certification is available for PSERC members (only). Send an email requesting PDH certification to Theresa.Herr@asu.edu with the subject "PDH" after the seminar. *Include the name and title of each participant.*

PSERC's Tele-Seminar Coordinator

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Shmuel welcomes feedback on the tele-seminars and suggestions for future ones.