



*Water Cycle Research  
Making a Difference*

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## Seminar Announcement:

**Speaker:** Dr. Alexander Kolovos, San Diego State University

**Title:** Knowledge Synthesis in Water and Energy Analysis

**Date:** Thursday, April 20, 2006

**Time:** 11:00am

**Location:** CREW Seminar Room  
4041 Powder Mill Road, Suite 302  
Calverton, MD 20705-3106 USA

## Knowledge Synthesis in Water and Energy Analysis

Dr. Alexander Kolovos

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The element of randomness in natural processes can not be ignored. The study of natural systems has benefited immensely from the application of stochastic techniques in the past few decades. Water cycle research is no exception to this approach: Traditional regression-based techniques like kriging and statistical optimization offer estimators that yield predictions in contemporary modeling. However, limitations in these techniques have been known for a long time, as well. For example, how suitable can be the choice of a linear estimator to predict nature's non-linear behavior? Also, modeling results are a direct consequence of the input information. Can any of the traditional methods claim to be able to handle scientifically uncertain input in an optimal manner?

Questions like the above are now successfully addressed in a recently developed framework for information processing known as Knowledge Synthesis. Through a brief, conceptual introduction, a comparison with regression techniques and a series of examples, some key features of Knowledge Synthesis are exhibited. Among them are its solid conceptual foundations on handling scientific knowledge; its ability to assimilate and rigorously analyze a variety of information types, both hard and soft (uncertain); its informativeness in the spatiotemporal predictions. Knowledge Synthesis optimizes its output by openly embracing scientific input from all possible related sources, and therefore strongly encourages cross-discipline interaction. As such an approach is crucial for water cycle research; the proposed framework makes for an excellent candidate in an integrated research program and a valuable tool for a holistic, end-to-end type of analysis.

**DIRECTIONS:** Take Interstate 95 north toward Baltimore. Take the first exit (29B - Route 212 West) to Calverton. Turn left at the first traffic light (intersection of Powder Mill Road and Beltsville Drive) into Centrepark.

Once at Centrepark there are three buildings (besides the movie theater). Building 4041, housing COLA & CREW, is the office tower on the right. The Sheraton College Park hotel is to the left of the twin office towers.

