Subject: Call for Abstracts --- Submission Details
From: <ewri@asce.org>
Date: 10/7/17, 1:05 PM
To: <elawhite@ucdavis.edu>

Call for Abstracts: ASCE-EWRI 2018 Congress

Access Key (password): **ECXI7714**

You can access your abstract any time by clicking here.

Abstract Type: Oral

: Student

Abstract Status: Complete

Abstract ID: 394467

Abstract Title: ***Machine learning for reservoir inflow temperature prediction in water resources management models***

Author(s)
Ellie White - Graduate Student Researcher, University of California Davis (Role: Author)

Co-Author(s)
John F. DeGeorge, Davis, CA - Principal, Project Manager, Resource Management Associates
Donald J. Smith, Davis, CA - President, Resource Management Associates
Stephen Andrews, Davis, CA - Senior Water Resources Engineer, Numerical Modeler, Resource Management Associates

Indicate your willingness to participate in a lightning round talk

- I am not willing to participate

Topic
Watershed

- Other

Abstract Submission
A model predicting water temperatures in a river reach enables water resource managers to investigate various mechanisms for water temperature improvements through operational and structural measures. Traditional temperature models are physically based; given user described system characteristics (e. g. , channel geometry, slope, flow, climate conditions), they use governing equations for heat conservation and fluid flow to predict water

temperatures. On the other hand, machine-learning models use statistical techniques that generally run fast, when modeling a large or complex watershed for water quality, and require little expert intervention in calibrating or tweaking parameters. This study develops a random forest model, a tree based machine-learning algorithm, for hourly streamflow temperatures in some California basins, using meteorological and basin characteristics as the predictor variables. The model is trained on historical estimates of streamflow temperatures, and its uncertainty is determined using a cross-validation approach. The test error from this comparison reflects the model's ability to capture the variations in temperature with 1-hour resolution. All predictor variables that contribute to modeling streamflow temperatures are ranked based on their relative importance (i. e. contribution to reducing the prediction errors). The model is also used to predict temperatures for a different river reach, which then serve as input into HEC-5Q, a reservoir water quality model developed by the Army Corp of Engineers. The output from HEC-5Q is benchmarked against traditional methods. The results of this study show the value of a machine learning approach to improve streamflow temperature prediction in California watersheds.

Copyright Transfer

that qualify as U.S. Government works by a contractor, ASCE acknowledges that the U.S. Government retains a nonexclusive, paid-up, irrevocable, worldwide license to publish or reproduce this work for U.S. Government purposes only. This policy DOES NOT apply to work created with U.S. Government grants.

Work-for-Hire

I, the corresponding author, acting with consent of all authors listed on the manuscript, hereby transfer copyright or claim exemption to transfer copyright of the work as indicated above to the American Society of Civil Engineers.
Ellie White 10/07/17

If you have any questions about your abstract, please contact EWRI at (703) 295-6380 or ewri@asce.org.

Don't forget, the abstract process closes 10/16/2017.

Technical Support
Email: Help@ConferenceAbstracts.com
Phone: (410) 638-9239

About the Abstract ScoreCard®
The Abstract ScoreCard® enables meeting planners to collect submissions and manage educational data online. It has been designed to fulfill the promise of our mission statement: Meeting Education Made Easy. To learn more about CadmiumCD's services, please contact us at info@CadmiumCD.com or call (410) 638 9239.