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Workshop sponsored by the:

***Hawaii Local Technical Assistance
Program***

*in cooperation with the
Hawaii State Department of Transportation,
University of Hawaii's Department of Civil &
Environmental Engineering
and the Federal Highway Administration*

Hydrologic Analysis and Modeling with WMS

Honolulu Community College
Building 2, Room 505
874 Dillingham Blvd.
Honolulu, Hawaii

January 29 - 31, 2008
8:30 a.m. – 4:30 p.m.

Registration begins at 8:00 a.m.
Lunch is not provided.

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Registration Procedure

- 1) Please contact Gail Ikeda at 808-956-8367, 808-956-8851 (FAX) or gail@eng.hawaii.edu by **Tuesday, January 15, 2008**.
- 2) Attendance is limited to 24 participants, and preference is given to local government employees.
- 3) Private company participation is on a space available basis at a fee of \$500.

Parking

Parking passes are available free of charge. If you would like a parking pass please contact us by January 15, 2008.

Payment Method

Payment for registration(s) can be made via Check – made payable to the Research Corporation of the University of Hawaii (RCUH), Purchase Order, Credit Card (Visa, MasterCard, Discover & American Express) or Purchasing Card.

Cancellations

Please contact us if you must cancel your registration or if someone will be substituting for you. Refunds will be made if notice of cancellations is received at least 3 workdays prior to the workshop date.

Hawaii Local Technical Assistance Program
University of Hawaii at Manoa
Department of Civil & Environmental Engineering
2540 Dole Street, Holmes Hall #383
Honolulu, Hawaii 96822



Course Description:

This course is designed as a hands-on, application-oriented training course using the Watershed Modeling System (WMS) to make hydrologic estimates using a variety of techniques. It will provide attendees with the knowledge and tools necessary to use data derived from geographical information systems (GIS) to develop hydrologic estimates and model runoff from watersheds. The course also teaches how to use digital terrain data for the development of watershed parameters that are required by most commonly used hydrologic analysis programs.

The WMS is a comprehensive environment for hydrologic analysis. It is developed by the Environmental Modeling Research Laboratory (EMRL) of Brigham Young University, and has been licensed for use by all State and Federal highway agencies. WMS makes it possible to take advantage of the wealth of digital terrain, land use, soil, and other GIS data readily available from government and private agencies. This data can then be used for preparing input files for several commonly used hydrologic models. Models supported by the interface include HEC-1 (HMS), TR-20, TR-55, and the Rational Method. This course also includes instruction in use of the regional regression equations contained in the National Flood Frequency (NFF) database. This course teaches the techniques and methods necessary to locate and use GIS data so that labor intensive processes such as delineating watershed boundaries and calculating modeling parameters from paper maps can be avoided when computing design flows and developing flow hydrographs at bridges and culverts.

Participants will receive a notebook that includes course materials, a WMS User's Manual, and copies of the software, workshops, and tutorials used in the course. Non-State highway agency course participants will receive a demonstration version of the proprietary WMS computer program.

Course Outcomes:

Upon completion of the course, participants will be able to:

- Automate basin delineation in WMS with GIS vector data, DEMs, and TINs
- Efficiently use digital watershed data for hydrologic modeling parameter development
- Locate and obtain digital data sources for watershed delineation and hydrologic model development
- Use WMS to build hydrologic input data files for use with HEC-1 (HMS), TR-20, TR-55, regional regression equations, and
- Rational Method programs, including instruction on how to graphically view the output

Target Audience:

Federal, State, and local hydrologic/hydraulic engineers who have responsibility for the design and analysis of highway stream crossings. In order to derive the most benefit from this training, course participants should have knowledge of the fundamentals of hydrology and hydrologic modeling. Experience with one of the aforementioned hydrologic modeling computer programs would be helpful.

Speakers:**Larry A. Arneson, Ph.D., P.E.**

Dr. Larry A. Arneson is a Principal Hydraulics Engineer with the Federal Highway Administration's (FHWA) Resource in Lakewood, Colorado. Larry is responsible for advanced applications and training using primarily one- and two-dimensional surface water and hydrologic models. He also has responsibility for sediment transport analysis, the evaluation and estimation of local scour at bridges, river morphology, stable channel design and maintenance, and local scour and bank erosion countermeasures. He is also very active in hydraulic engineering research, National Cooperative Highway Research Program (NCHRP) Panels and the American Association of State Highway Transportation Officials (AASHTO) Technical Committee on Hydrology and Hydraulics.

Jim Nelson, Ph.D.

Dr. Nelson is an Associate Professor in Civil and Environmental Engineering Department at Brigham Young University in Provo, Utah. He specialized in hydrology and automated watershed characterization from digital terrain data and teaches courses in computing, surveying, hydrology and hydrologic modeling, and geographic information systems. His research has resulted in the development of the Watershed Modeling System (WMS) that assists engineers in developing hydrologic models from digital elevation, soils, land use, and other electronic sources. WMS has been distributed to government, private, and university institutions in more than 100 countries. FHWA has licensed WMS as a standard for performing hydrologic analysis within state departments of transportation.