
AWRA 2011 ANNUAL WATER RESOURCES CONFERENCE
Albuquerque, New Mexico

November 7-10, 2011

Copyright © 2011 AWRA

**GETTING TO SCALE WITH ENVIRONMENTAL FLOW ASSESSMENT:
THE WATERSHED FLOW EVALUATION TOOL**

John S. Sanderson*, Nicole Rowan, Thomas Wilding, N. LeRoy Poff, Brian Bledsoe, William J. Miller

ABSTRACT: Growing water demand across the world is increasing the stress on river ecosystems, causing concern for both biodiversity and people. River-specific environmental flow assessments cannot keep pace with the rate and geographic extent of water development. Society needs methods to assess ecological impacts of flow management at broad scales so that appropriate regional management can be implemented. To meet this need in Colorado, USA, we developed a Watershed Flow Evaluation Tool (WFET) to estimate flow-related ecological risk at a regional scale. The WFET entails four steps: (1) modeling natural and developed daily streamflows, (2) analyzing the resulting flow time series, (3) describing relationships between river attributes and flow metrics (flow-ecology relationships), and (4) mapping of flow-related risk for trout, native warm-water species, and riparian plant communities. We developed this tool in two watersheds with differing geomorphic settings and data availability. In one of the two watersheds, the WFET was successfully implemented to assess ecological risk across the 3400 km² watershed, providing consistent watershed-wide information on flow-related risk. In the other watershed, active channel change and limited data precluded a successful application. In Colorado, the WFET will be used to evaluate the risk of impacts on river ecosystems under future climate change and water development scenarios (e.g., for energy development or municipal water supply). As water continues to be developed for people, the WFET and similar methods will provide a cost-effective means to evaluate and balance ecosystem needs at large scales.

* Water Program Director/Freshwater Ecologist, The Nature Conservancy, 117 East Mountain Avenue, suite 201, Fort Collins, CO 80524 USA, Phone: 303-324-2924, , Email: jsanderson@tnc.org