

Ebersole, J.L., C.E. Torgersen, D.M. Keenan, and A. Fullerton. 2014. IDENTIFYING, PROTECTING, AND RESTORING (?) FINE-SCALE THERMAL HETEROGENEITY IN STREAMS. Invited Oral Presentation to the Joint Aquatic Sciences Meeting, Portland, OR. May 18-23, 2014.

### **Abstract**

The functional role of thermal heterogeneity to fish in warm streams has been well recognized in the scientific literature, and is increasingly invoked as an important aspect of biodiversity conservation. Water temperature standards designed to protect cold-water taxa are also beginning to incorporate concepts of thermal heterogeneity. Given this emphasis, there is a need to identify factors that create and maintain cold-water refuges in streams, and understand their functional significance to fish and other taxa. Previous talks in this session reviewed the suite of stream structures and processes that influence hydrologic connectivity between subsurface and surface waters and subsequently regulate thermal heterogeneity in streams. We discuss implications of these processes for identification, monitoring, protection, and conservation of thermal heterogeneity. Considerations for guiding a resilient and adaptive approach for management of thermal heterogeneity in streams and rivers include: integration of multiple perspectives including hydrology, geomorphology, and ecology; recognition of hierarchical structure and context for thermal patterns and ecological responses; and anticipation and responsiveness to climate change.