

**Topic:**

EFN science and applications

**Title:**

Channel morphology, variability of aquatic habitat, and implications for flow allocations in coastal streams

**Description:**

In forested mountain channels and other stream systems, the physical conditions dictating habitat and ecological integrity are a function of streamflow characteristics and other processes shaping channel form. Land management operations and major storm events are known to alter the timing and locations of additions of water, sediment, and wood to such channels, thereby influencing the location and abundance of good quality habitat for a variety of organisms. Our understanding of how aquatic habitat varies as a function of changing channel form remains limited, and may have notable implications for how streamflow should be allocated. Based upon four decades of data annually-collected from eight study areas of Carnation Creek, British Columbia, this poster displays how temporally variable channel morphology and wood loading impact the quantity and quality of habitat available under different modelled flow regimes.

Topographic channel bed surfaces interpolated from survey data were combined with mapped dimensions and positions of large wood pieces as inputs to Nays2DH, a depth-integrated hydrodynamic modelling program. Simulations were run under eight flow conditions ranging from very low (7Q10) to mean annual discharge in each study area. A range of habitat variables were then extracted for each specified flow. Results indicate that for a given flow level, different channel reaches showed differing degrees of variability in riffle and pool habitats through time. Gravel bars are shown to disperse or migrate, resulting in temporally variable channel bed topography and complexity for a given flow level. Additionally, wood abundance and piece sizes varied notably among sites and through time, resulting in highly variable structural cover of wetted channel areas. These results reveal the challenges of specifying EFNs and are helpful for determining how habitat parameters may vary under different flow threshold selections for environmental flow needs in coastal British Columbia.

**Authors:**

David Reid

UBC Geography