

**DIWPA International Field Biology Course (IFBC) 2014**  
**A study of the genetic diversity and connectivity of  
freshwater invertebrates along a longitudinal gradient in  
multiply stressed streams in Japan**

This study is investigating the genetic diversity and connectivity of *Hydropsyche orientalis* and *Cheumatopsyche brevilineata* (Fig. 1; two ubiquitous net-spinning Trichoptera) along a longitudinal gradient in multiply stressed streams in Japan. The study complements the earlier work of Ogawara *et al.* (2003; Evaluation of River Environment Based on the Genetic Diversity of *Hydropsyche orientalis*...; JJSWE 26:4-223-229) that found a significantly higher level of genetic diversity of *Hydropsyche orientalis* in natural sites compared to sites impacted by human structures in the Natori River catchment in Miyagi Prefecture, Japan. Invertebrate kick-net samples were collected from 20 sites in Yasu River catchment (Fig. 2) during April 2014 and from 12 sites in the Kiso River catchment (Fig. 3) during the DIWPA IFBC (August 2014). Of the sites sampled, *Hydropsyche orientalis* was present at 11 sites in the Yasu River catchment and 4 sites in Kiso River catchment. In contrast, *Cheumatopsyche brevilineata* was present at 18 sites in the Yasu River catchment, but absent from all sites in the Kiso River catchment. The DNA from these samples is now being sequenced using both CO1 barcoding and next generation RAD sequencing to study the genetic structure, diversity and geneflow of each taxon in detail. This knowledge will be used to improve our understanding of the genetic basis of stream invertebrate species' resistance to stressors and the potential barriers to their dispersal.



Fig 1. *Cheumatopsyche brevilineata* (left), *Hydropsyche orientalis* (right)

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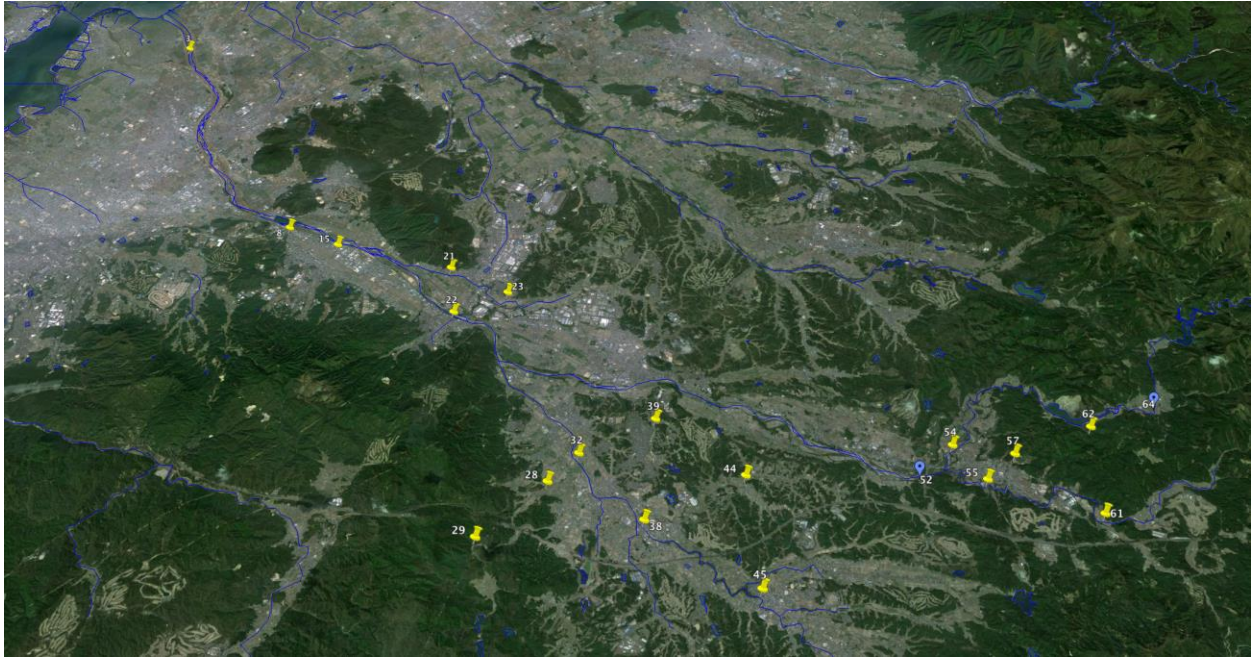


Fig 2. Yasu River sampling sites (20 total)

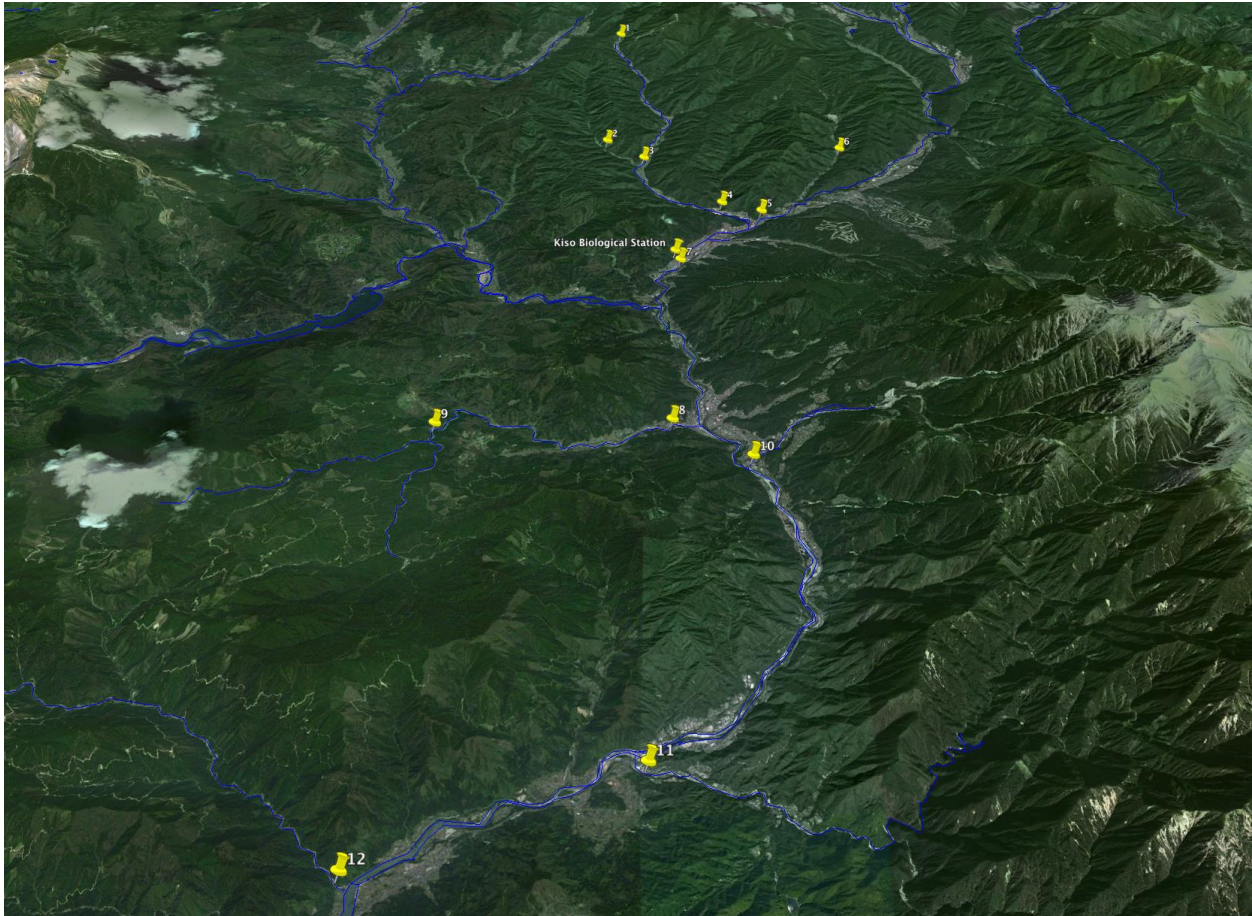


Fig 3. Kiso River sampling sites (12 total)