



## Murdoch McAllister

Associate Professor in Fisheries Assessment and Statistics, Institute for the Oceans and Fisheries, University of British Columbia

**Time: 10:00am - 11:30am, 21 November 2016**

**Venue: Seikai National Fisheries Research Institute**

(1551-8, Taira-machi, Nagasaki-shi, Nagasaki)

### Use of models of intermediate complexity (MICE) to quantify trophic and fishery dynamics and identify triggers of severe declines in Kootenay Lake's trophy trout fishery

**Abstract:** In British Columbia, large lakes (>10000 hectares) support recreational fisheries for trophy-sized rainbow trout. In the past few years, severe declines in both the target and forage species occurred on the largest of these fisheries. Since the 1960s the Kootenay Lake fishery for the Gerrard strain of rainbow trout (*Oncorhynchus mykiss*) had attracted thousands of anglers from across North America and contributed \$5-10 million annually to the regional economy. Giant rainbow trout (up to 15 kg) increased to a 50-year historic high in 2012 and declined to historic lows in 2015 and 2016. The Gerrard rainbow's only forage fish, kokanee (*O. nerka*), concurrently dropped from about 1-2 million spawners to 0.02 million. Fisheries biologists and managers remain uncertain about what triggered these declines and are currently considering options to try to rebuild both species and the fishery. In my talk I will review the development of a predator-prey-fishery dynamics model, a two-species Bayesian statistical catch-at-age model, to describe the numerous fishery and ecological data compiled for Kootenay Lake and test hypotheses about the strength of predator-prey interactions. A model that explicitly incorporates the predator-prey interaction explained long-term data of field and fishery surveys much better than single-species models without any interactions. Management reference points differed considerably between the model formulations. I will also review the application of the model to identify potential triggers of the recent declines and the effectiveness of different management actions to recover the fishery.

