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Theme: Special Sessions  
Session: ThG2 - Capacity utilisation

Title: **Estimating Heterogeneous Primal Capacity and Capacity Utilization Measures in a Multi-Species Fishery**

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Abstract: Efficient management of natural resources hinges on our ability to monitor and assess the status of the resource stocks as well as the actions and economic performance of the agents utilizing such resources. The sustainability and viability (both in physical and economic terms) of our resource management plans can in part be assessed by estimating the extractive or productive capacity of economic agents relying on a given resource. However, because of the limitations and uncertainty associated with the available data, particularly in the fishing industry, estimating the capacity and capacity utilization of the agents using the resource can be a difficult endeavor. Compounding the difficulties of estimating capacity is the heterogeneous nature of the agents using the resource. Heterogeneity in the agents implies that multiple production processes may exist, which must be accounted for when attempting to measure capacity and capacity utilization.

This research addresses this concern by estimating heterogeneous capacity and capacity utilization, using latent class regression analysis, in the context of a multi-species fishery and it illustrates the complexities that arise in the presence of heterogeneous production technologies - a common situation in multi-species, multi-gear fisheries. Our results indicate that there exists substantial heterogeneity in the production technologies possessed by fisherman within the Eastern Bering Sea flatfish fishery. This in turn translates to differences in the capacity estimates generated using the heterogeneous production frontier model when compared to the traditional homogeneous model. Given the superior empirical fit of the heterogeneous production frontier, this indicates that traditional homogeneous production frontier will overestimate production capacity when heterogeneity in production technologies exists.