



**Adapting Fisheries Management to a Changing Ecosystem**  
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**Keynote 1**

**Including ecosystem information in assessments and management advice**

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ABSTRACT

Many of the contemporary approaches for providing fisheries management advice are predicated on the assumption of stationarity, and hence that additional data lead to better estimates of the quantities on which harvest control rules are based. However, it is becoming increasingly obvious that the assumption of stationarity is a flawed concept given environmental change, and that assessments and harvest control rules need to be adjusted to account for time-variation in population dynamic parameters. However, it remains unclear how to achieve this and whether incorrectly doing so will lead to unexpected and perhaps highly undesirable outcomes. This talk will outline how ecosystem information, which relates to quantities that are 'easily' monitored such as weight- and selectivity-at-age and quantities such as natural mortality, the average value of which is seldom well estimated even in well-studied systems, could be included in stock assessments. It will also outline how environmental change can be included in harvest control rules and hence the provision of management advice. The approaches will be illustrated using simulations and some of the approaches being taken as part of the Alaska Climate Integrated Modelling (ACLIM) Project, which is developing a suite of models that better utilize ecosystem information. The dangers of incorrectly including ecosystem information in assessments and harvest control rules means that overcoming the failure of the assumption of stationarity will not only require more sophisticated assessments, but also improved testing of methods using simulation, a better understanding of the policy implications of the associated trade-offs among conflicting objectives, and perhaps substantially enhanced and dynamic monitoring systems.