Seminar Announcement

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Causal Drivers of Barents Sea Capelin Population Dynamics on Different Time Scales

Sam Subbey
Institute of Marine Research, Bergen, Norway

ABSTRACT

The dynamics of marine populations are usually forced by biotic and abiotic factors occurring at different intensity levels and time scales. Deriving the time frame within which each factor has a causal influence is important for predicting population trajectories. I shall present a statistical methodology for establishing (i) the strength of causal coupling between population dynamics and environmental (biotic and abiotic) factors, and (ii) the time scales over which causal covariates have significant influence on the population dynamics. The methodology is based on combining a multivariate autoregressive (MAR) model fit to data (to determine causal direction) with a quantification of the Relative Power Contribution (RPC) of covariates in frequency domain (to quantify the strength of connection). The methodology is applied to test the existence of causal coupling between the capelin biomass and a selected number of covariates identified in the literature.