Exploring complexity in seabird foraging behaviour

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Due to ongoing climate change, it is necessary to understand how ecosystems will react and more particularly, how species may cope with the challenges of living in unstable systems. As top predator, seabirds' behaviour provides a way to monitor changes occurring in the marine environment, but identifying how the temporal structure and complexity of behaviour depend on intrinsic and extrinsic parameters are underexplored topics in the field of animal behaviour. To address this, we are using Detrented Fluctuation Analysis (DFA) on several species of penguins in order to investigate if behavioural organization, through a gradient of determinism-stochasticity complexity, allows seabirds to buffer changes arising in their environment. Our results suggest that complexity of foraging behaviour is closely related to environmental conditions, such as variation in bathymetry, sea-surface temperature, water stratification or sea-ice condition. For example, individuals foraging in deep waters exhibited higher stochastic foraging sequences than individuals foraging in shallow waters. This approach linking environmental conditions and complexity of behavioural organization can provide novel information about the influence of the environment on behavioural processes in diving animals like seabirds which are often used as environmental indicators.