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FEEDRES - Feedback mechanisms approach to resolve regime shifts in ecological systems.

Our planet is changing at a pace that we never experienced before. External pressures such as warming, are pushing our ecosystems towards dramatic and abrupt changes. These types of dynamics are defined in ecology as “regime shifts” and are described as abrupt and irreversible shifts which lead to a reorganization of ecosystems, with important repercussion on the socio-economic system. Marine ecosystems are particularly prone to these dynamics and regime shifts have been reported in different systems worldwide. Studying regime shifts in large marine ecosystems such as the Mediterranean Sea, is particularly difficult since these systems are large, heterogenous and substantially invisible. Past approaches included either statistical modelling to detect the presence of regime shifts in the past (but not really to predict them), or mechanistic modelling, that however is not able to model novel dynamics of complex systems. Thus, until now understand how regime shifts occurred and predict their occurrence in complex systems resulted impossible. FEEDRES aims at developing a groundbreaking statistical approach to study regime shifts. FEEDRES will focus on unravelling mechanisms of regime shifts in complex systems at different organizational levels and will study all European marine ecosystems. Moreover, FEEDRES will map past regime shifts worldwide. The results of FEEDRES will help to understand how to manage these types of dynamics but also how to anticipate and project them. Thus, FEEDRES will revolutionaries the current way to approach and study regime shifts and will increase our knowledge on complex marine ecosystems, which is fundamental in this period of climate change.

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