Must Read
F1000 Factor **6.0**
EndNote
Download citation
Send page by email

The Mediterranean Sea regime shift at the end of the 1980s, and intriguing parallelisms with other European basins.

Conversi A, Fonda Umani S, Peluso T, Molinero JC, Santojanni A, Edwards M

PLoS One 2010 **5**(5):e10633 [abstract on PubMed] [citations on Google Scholar] [related articles] [FREE full text]

Selected by | Ferdinando Boero NEW
Evaluated 3 Jun 2010
Relevant Sections

Faculty Comments & Author Responses

Faculty Member	Comments

Ferdinando Boero
Universita' del Salento, Italy
Ecology

Confirmation
Hypothesis
Tech Advance

In a period of global climatic change, chances are good that ecosystems change accordingly in both their structure and function. These modified conditions might be conducive to regime shifts. This paper reconstructs the climatic and ecological history of the Mediterranean Sea, showing that regime shifts actually occurred and that the basin of today is substantially different from the basin of 30 years ago. Similar changes are detected also in other basins, suggesting that regime shifts are occurring at a global scale, due to both global and local drivers.

A recent article {1} warned about the possibility of predicting regime shifts, but the individuation of large-scale climate trends might lead to obvious predictions of regime shifts, such as: if the climate is becoming warmer, then species of cold water affinity will become rarer, whereas species of tropical affinity will become dominant. This is what is actually happening in the Mediterranean Sea {2}. Such Lapalissian predictions do not require sophisticated tools to be performed. It is however important, as is done in this precious paper, to identify a sequence of events and to single out the drivers that led to their occurrence. In a paper of which I am co-author {3} (uncited by the authors) these regime shifts are already depicted for the Adriatic Sea, albeit less precisely than here. This paper documents a series of events that sees first a period with abundant fish, followed by a period of jellyfish dominance, and then a period of dinoflagellate red tides, followed by mucilages of presumed bacterial origin. These are coupled with climatic conditions, and similar changes are described also in North, Baltic, and Black Seas. The authors consider that the events they describe are probably the result of multiple stressors, of both local and global scale and importance. Meanwhile, at a global scale, a regime shift is taking place: the shift from a fish to a jellyfish ocean, as I described with co-authors in a recent review {4}. Jellyfish increases might be the result of both overfishing (from local to global) and global warming. The correlation of increasing jellyfish abundance with decreasing fish abundance is high, as it is high, however, with increasing temperatures. Both overfishing and climate warming are occurring at a global scale, but with different patterns, and probably they both concur in determining the fish-jellyfish phase shift. Almost seven billion people living on the planet exert a global pressure determined by the many small scale pressures that can be easily measured at a local level. This paper is a well documented support that the world ecosystems are rapidly changing, and in some cases the change is not gradual. Situations that, by experience, we considered as "normal" are changing so quickly to be labelled as regime shifts. Maybe these alternative situations of stability and instability can be the drivers of what evolutionists call gradual and punctuated evolution. If this were true, the present one should be a period of creativity for evolution, the ecological vacuum of the species that cannot become adapted (or that are not pre-adapted) to the new conditions will be filled by the species that will adapt (or are pre-adapted) to them. Let's only hope that our species fall within the second category.

References: {1} Hastings and Wysham, Ecol Lett 2010, 13:464-72 [PMID:20148928]. {2} Lejeusne et al. Trends Ecol Evol 2010 25:250-60 [PMID:19959253]. {3} Boero and Bonsdorff, Mar Ecol 2007, 28:134-45 [DOI:10.1111/j.1439-0485.2007.00171]. {4} Boero et al. Mar Ecol Progr Ser 2008, 356:299-310 [DOI:10.3354/meps07368].

Competing interests: None declared
Evaluated 3 Jun 2010 NEW

How to cite this evaluation

Faculty Comments & Author Responses

How to cite the Faculty of 1000 Biology evaluation(s) for this paper

1) To cite all the evaluations for this article:

Faculty of 1000 Biology: evaluations for Conversi A et al *PLoS One* 2010 5 (5) :e10633 http://f1000biology.com/article/id/3413958/evaluation

2) To cite an evaluation by a specific Faculty member:

Ferdinando Boero: Faculty of 1000 Biology, 3 Jun 2010 http://f1000biology.com/article/id/3413958/evaluation