

IOW-Press Release of November 4, 2014

What happens to the NAO?

Recent statistical analyses reveal loss of predictability

A recently published article in the journal „frontiers in ecology and evolution“ by Joachim Dippner, Caroline Möller and Ingrid Kröncke showed by statistical analyses that the close coupling between climatic and biological data as it was valid for the period between 1977 – 2000 no longer is detectable in the following years.

The North Atlantic Oscillation (NAO), this interplay between Azores High and Icelandic Low, is decisively influencing the winter climate on the Northern Hemisphere. It is already known since the 1990s that there are four prevailing modes: (1) a positive NAO phase, defined by an increased westdrift directing mild and humid air to Europe, (2) a negative NAO phase with strong conditions of easterly winds and cold winters in Europe as well as two blocking situations over (3) Scandinavia and (4) Western Europe.

Among the long series of meteorological readings, statistical analyses clearly reveal phases of consistent climatic regimes. Joachim Dippner and his co-authors have focused on three of them: a regime from 1977 to 1988 with NAO⁻ predominant, a NAO⁺ regime from 1989 to 2000 as well as the following period until 2013. In parallel, they investigated the changes among the dominant species and taxonomic groups of the benthic macrofauna and the benthic community in the Southern part of the North Sea off Norderney.

The result shows that the shift between the two regimes NAO⁺ and NAO⁻ also known as regime shift – is also reflected in changes within the benthos – the marine communities living on or in the seafloor.

After 2000, the picture changes considerably: a persistent NAO regime can no longer be detected. The authors name the NAO's behavior chaotic. Simultaneously, abrupt changes occur in the benthic communities. They no longer can be related to any dominant NAO mode. Thus, future scenarios referring to the development of the ecosystems become increasingly difficult.

These findings were published under:

Dippner, J. W., C. Möller and I. Kröncke (2014). Loss of persistence of the North Atlantic Oscillation and its biological implication. *Front. ecol. evol.* 2: 57, doi:10.3389/fevo.2014.00057



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