THE OCEAN AT EXTREMIS



Ocean extremes as

a threat to ocean health

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Ocean temperatures are currently at extremis



Ocean temperatures are at extremis



For 18 consecutive months, global average sea surface temperature was way above anything that the ocean had seen in the previous decades.

The impact of marine heatwaves on marine life



The multi-stressor challenge to ocean health



Ocean health is currently being stressed by (at least) ocean warming, ocean acidification, and the loss of oxygen.

These changes invariably will lead to an increase in extremes, possibly occurring simultaneously → compound extremes



Habitat compression by extremes







We are analyzing single and compound extremes from the perpective of habitat compression, i.e., what fraction of the upper water column is affected by an extreme, and is thus likely not suited as a habitat.

The 2014-2015 "blob" as a triple whammy



The 2014-2015 "blob" is a massive and deep-reaching double and triple whammy event!

Triple whammies are a new phenomenon



With high likelihood, the 2014-2015 "triple whammy blob" has created entirely novel conditions, not experienced by the system in the past.

And what about the impact on organisms?





The ocean at extremis

Ocean biogeochemical extreme events are becoming common, are intensifying rapidly, and extending over large regions. These trends are largely human-driven.

• The study of ocean extremes requires us to bring together new types of observations, high-resolution modeling, and experimental work.

 Of high concern is the determination of the impacts of extremes on marine organisms and ecosystems.



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