
HR: 13:30h

AN: OS13B-03

TI: [Early detection versus prediction of ocean circulation changes: Implications for the design of observation systems](#)

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AB: Anthropogenic greenhouse gas emissions may trigger an abrupt and/or hysteresis response of the ocean circulation system. One relevant example for such a threshold response is a potential weakening or collapse of the North Atlantic meridional overturning circulation (MOC). Numerous studies have analysed the question of how to design an MOC observation system that would deliver an early warning signal of MOC changes (i.e., before past actions have committed the system to a threshold response). However, detection may be of limited relevance to the prediction question: Whether and when would the MOC cross a critical threshold? Here we test the hypothesis that MOC observation systems designed for early detection of anthropogenic MOC changes would likely fail in the task of early prediction. To test this hypothesis, we virtually deploy candidate observation systems into a simple model that mimics the potential range of future MOC responses. We use this framework to estimate the reliability of candidate observation systems in achieving early detection and prediction.

DE: 1605 Abrupt/rapid climate change

DE: 4260 Ocean data assimilation and reanalysis

DE: 4262 Ocean observing systems

DE: 4263 Ocean predictability and prediction

DE: 6309 Decision making under uncertainty

SC: Ocean Sciences [OS]

MN: Ocean Sciences 2006