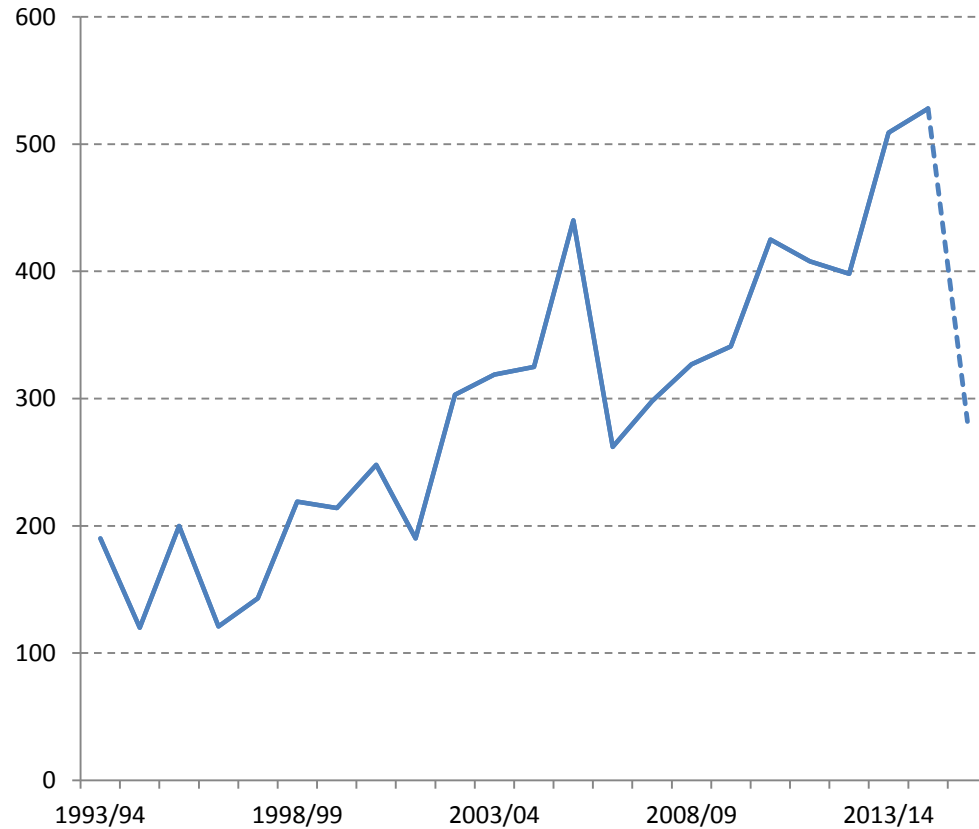




HARMATTAN, EL NINO AND PRODUCTION

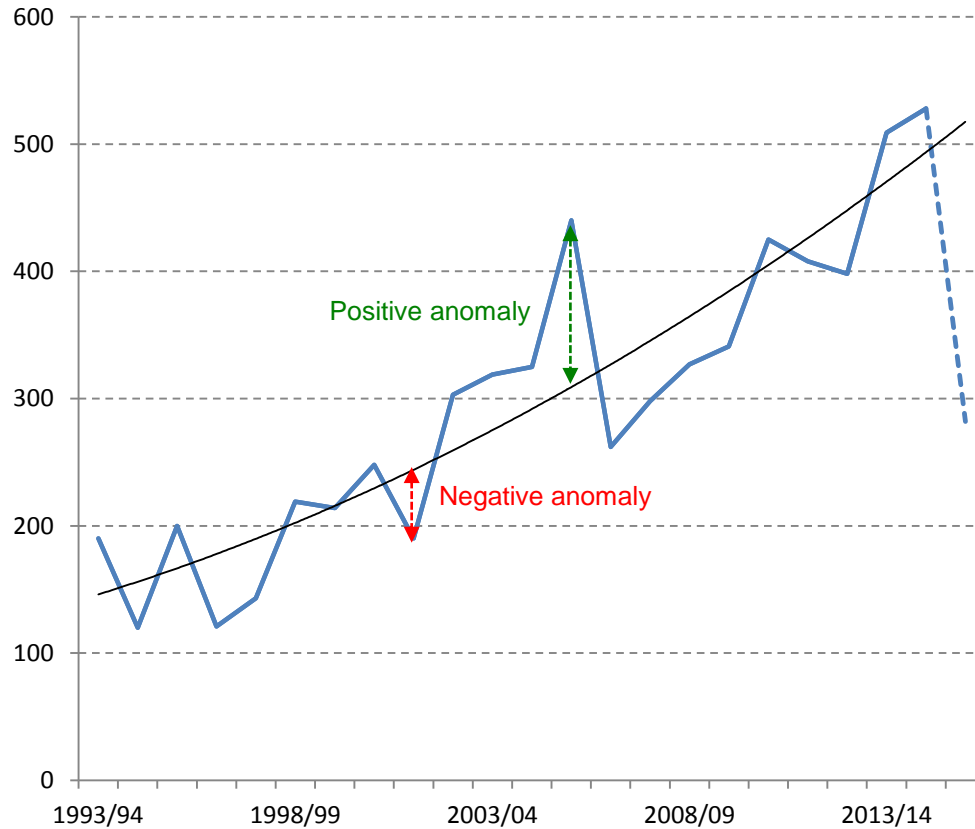
27 SEPTEMBER 2016





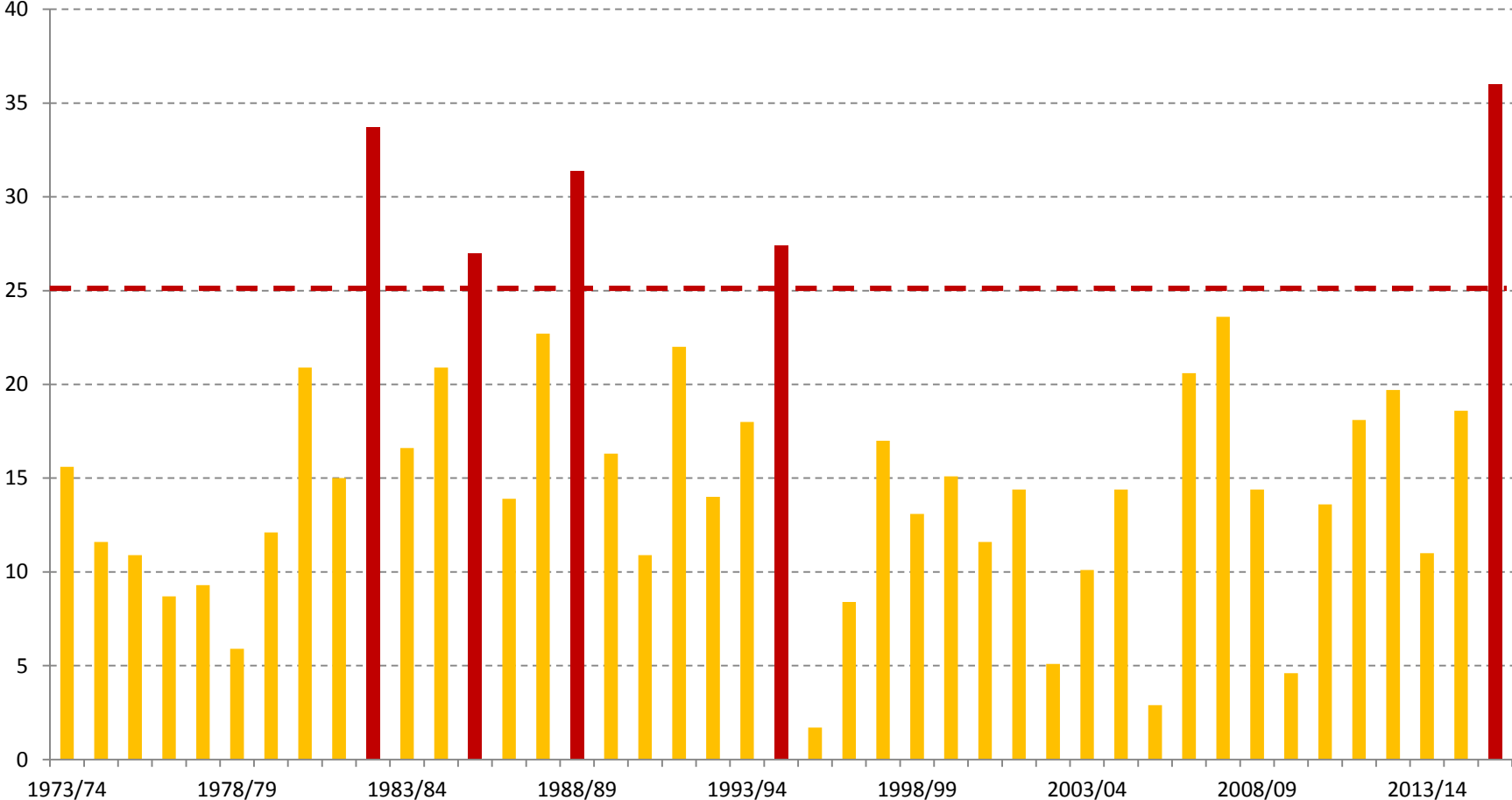
- Mid crops have considerably increased over the past 20 years, from 120,000 tonnes in 1994/95 to 528,000 tonnes in 2014/15.

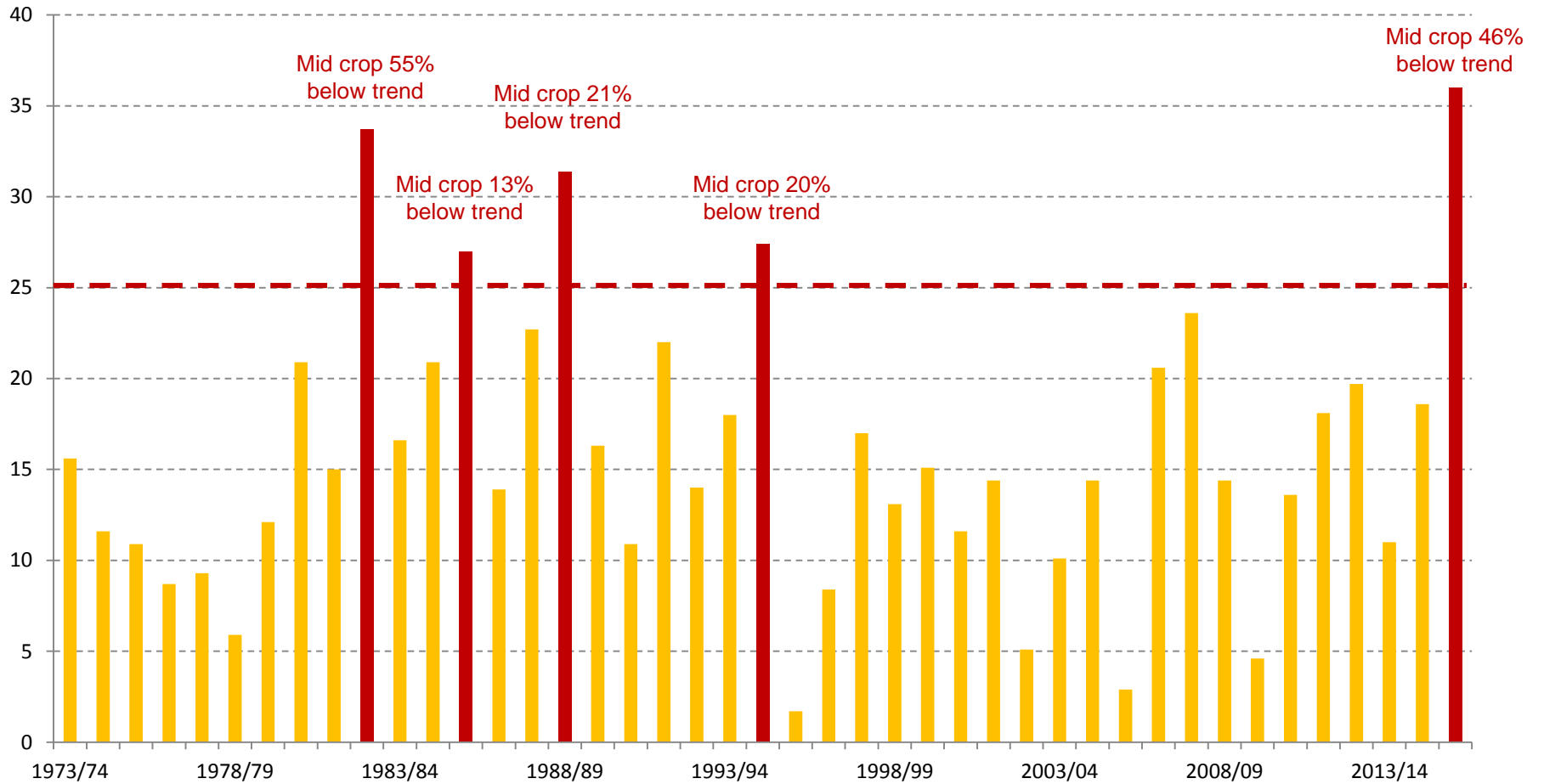
- Strong upwards trend, but significant deviations from the trend make it challenging to forecast, even with pod counts.



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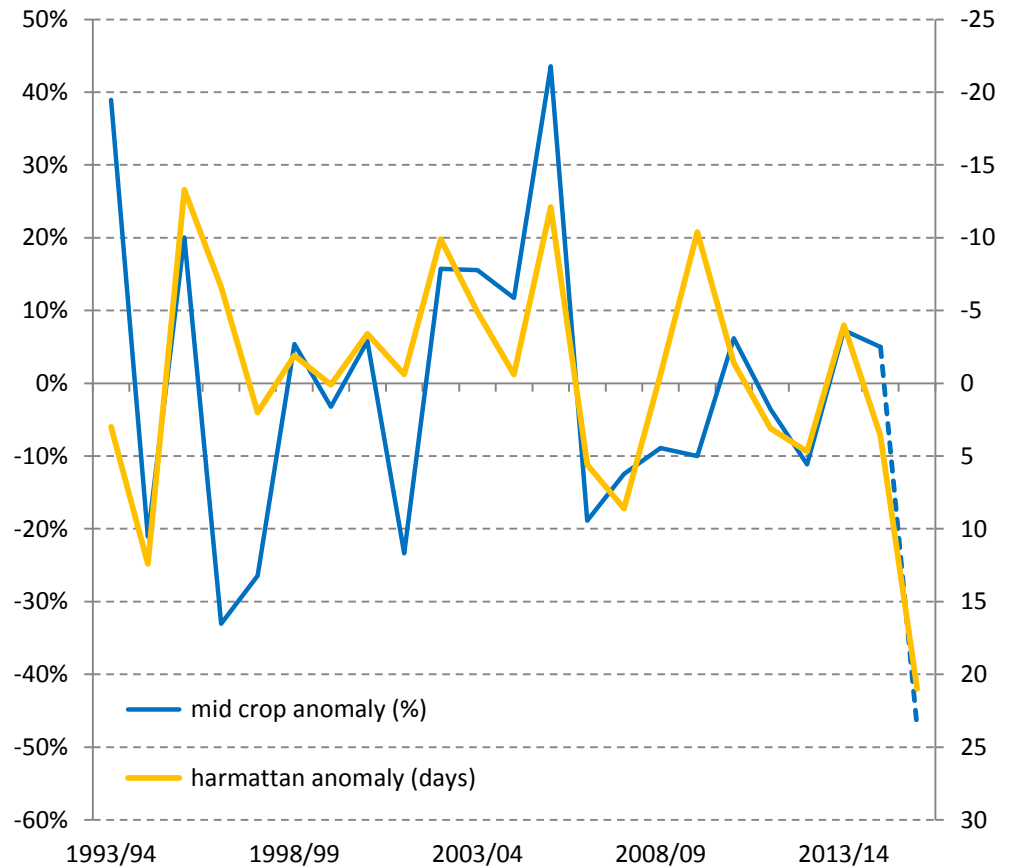


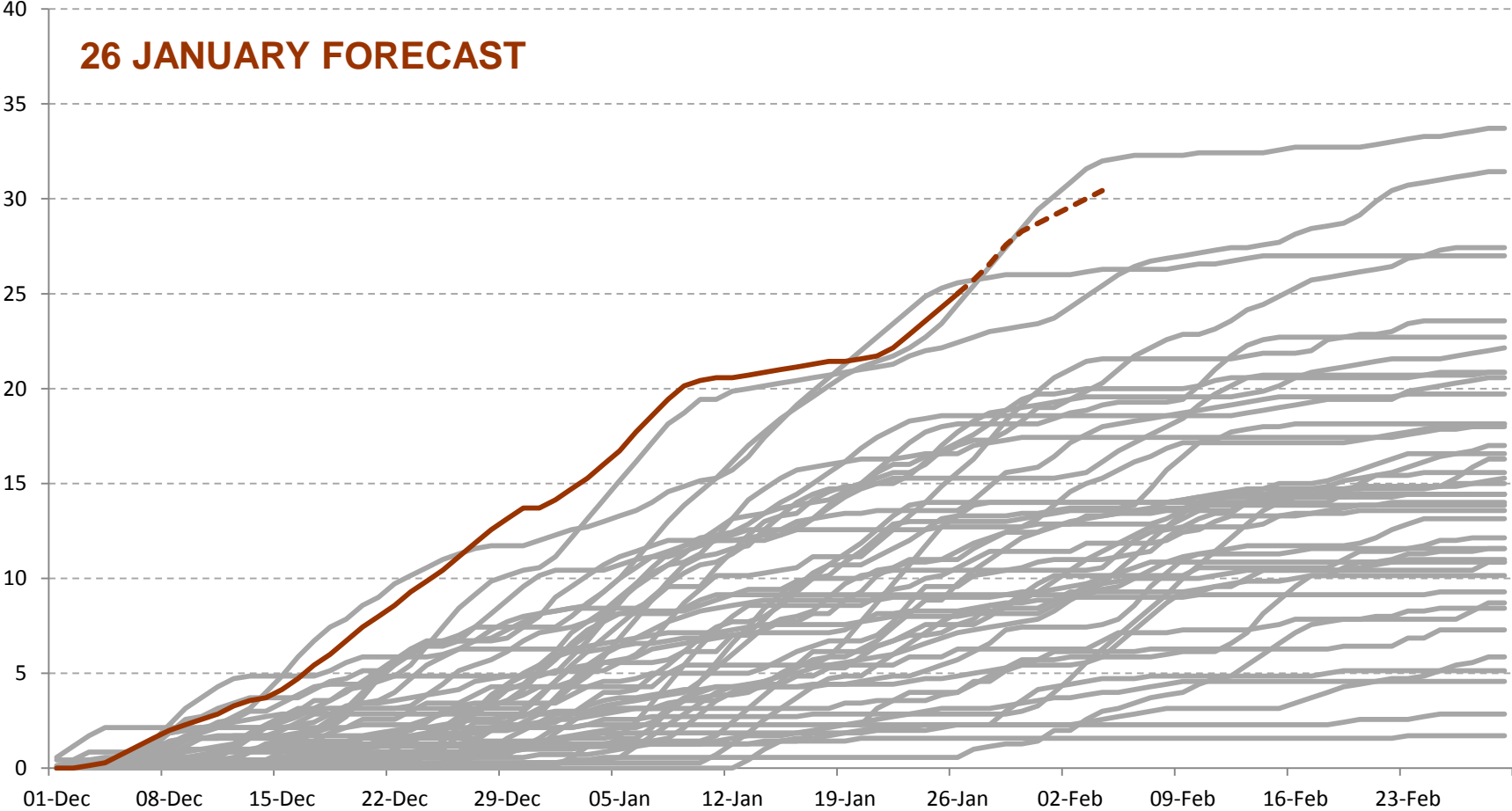


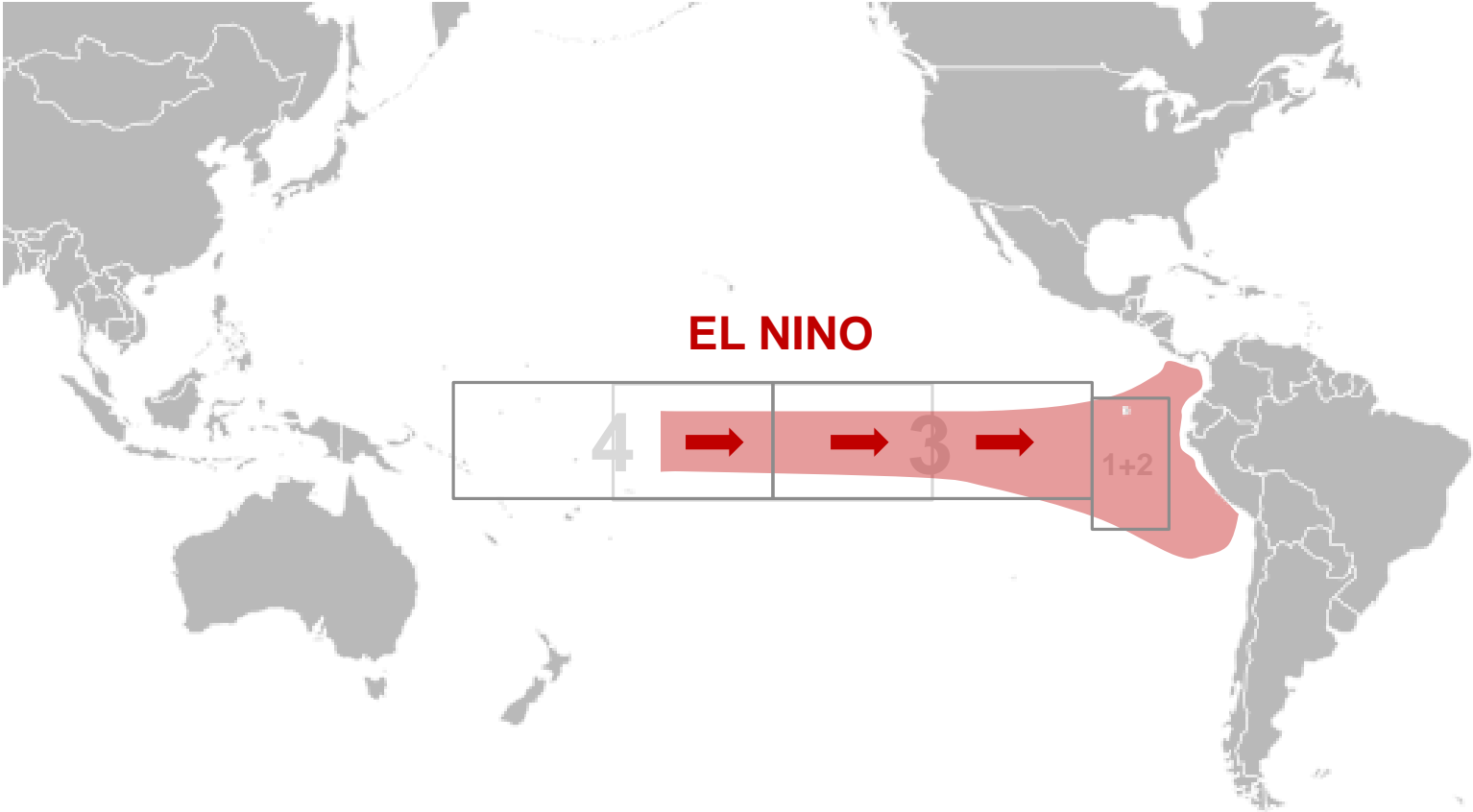
Clear relationship between Harmattan conditions and production anomalies.

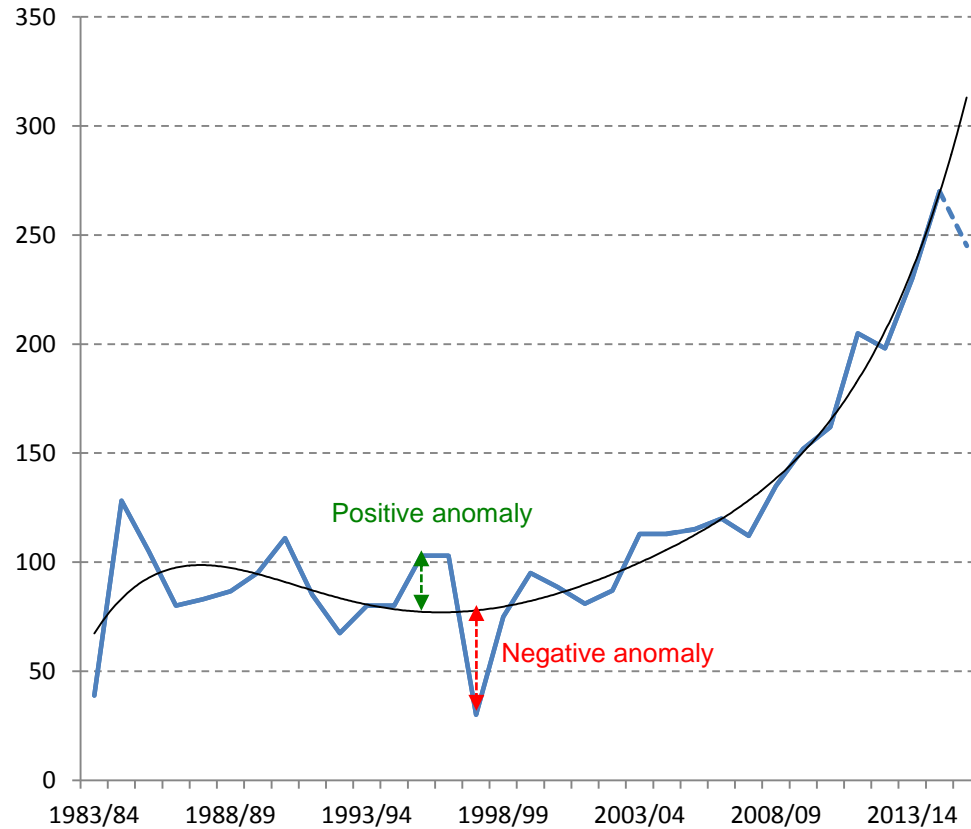
For each day of Harmattan, the mid crop loses about 1%.

Non linear relationship, for extreme events losses are about 1.5% per day.



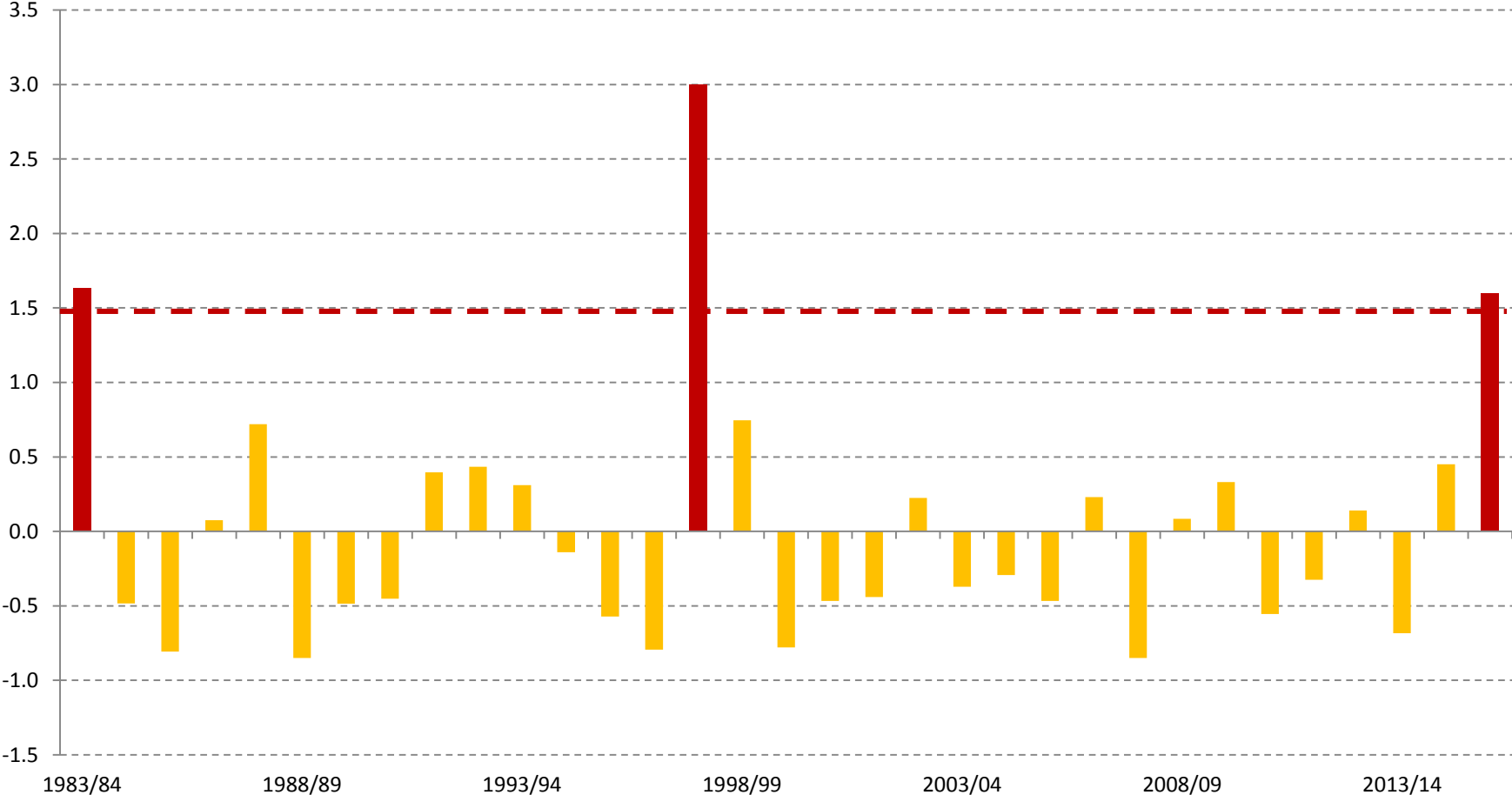


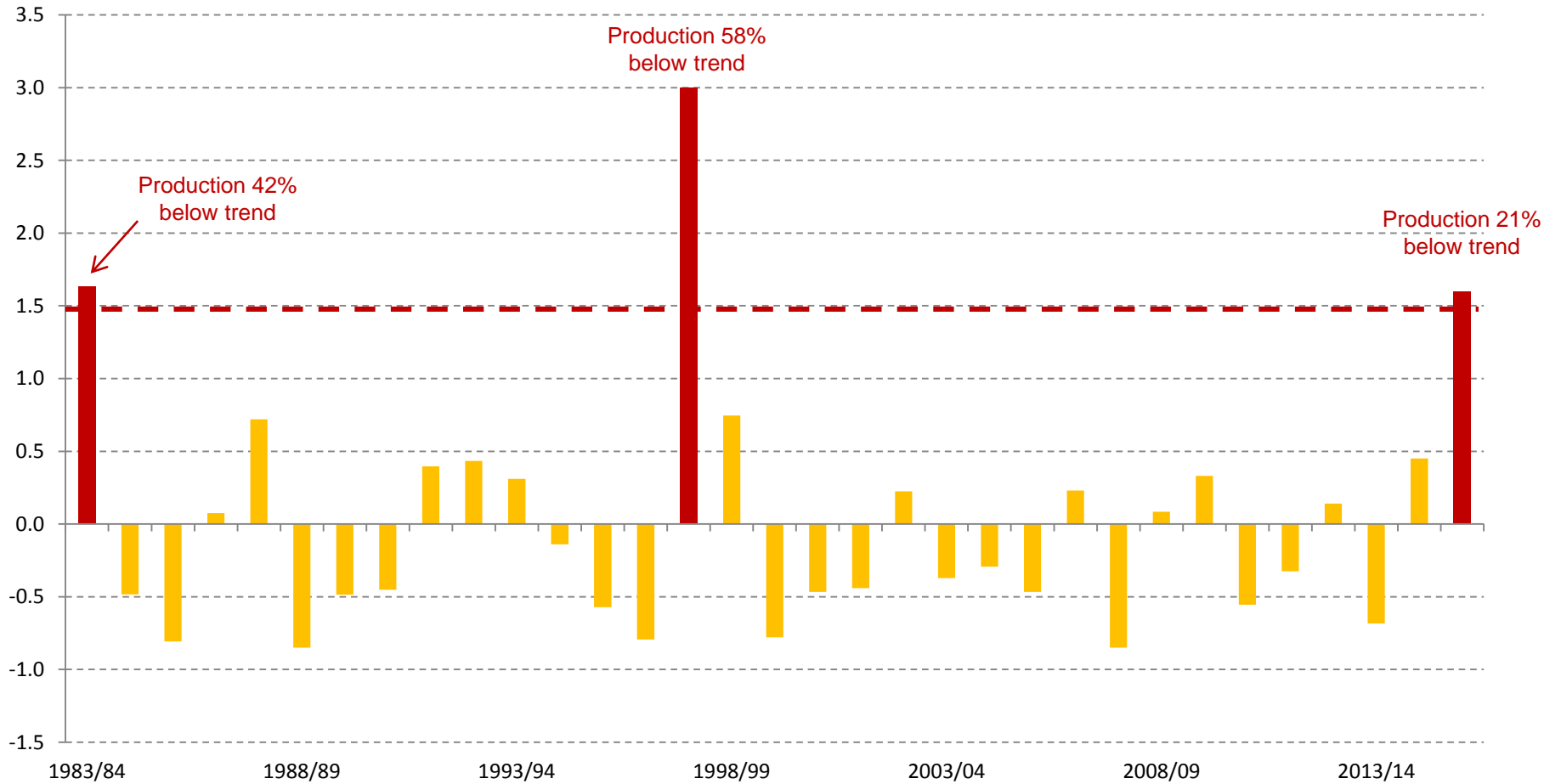




- Strong upwards trend for the past twenty years.
- Ecuador production is extremely sensitive to disease incidence.
- Potential impact of El Nino is growing.

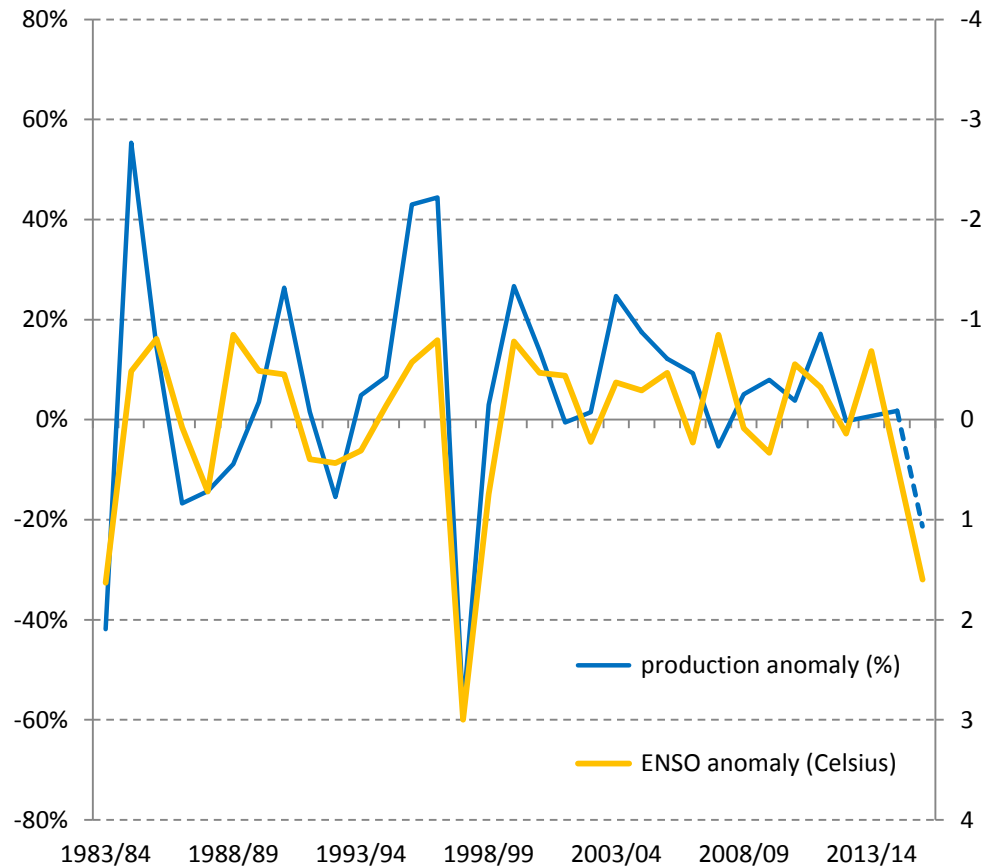
EL NINO ECUADOR





Strong relationship between water temperature and production, especially in the case of strong events.

For each degree of positive anomaly, Ecuador production loses 15-20%.



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