



## **From the Persian Gulf to the Indian Ocean - how the Gulf of Oman modulates properties and variability of Persian Gulf Water**

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Persian Gulf Water (PGW) can be observed as far east as the Bay of Bengal, at a density of approximately  $1026.4 \text{ kg.m}^{-3}$ , having been formed far west in the Persian Gulf. PGW is significantly more oxygenated than the water of the Arabian Sea and Bay of Bengal oxygen minimum zones and serves to oxygenate the northern Arabian Sea. The impact and pathways of PGW across the wider Indian Ocean are modulated by transformations in the Gulf of Oman and by the timing of its outflow into the northern Arabian Sea.

In the Gulf of Oman, PGW flows out of the Straits of Hormuz, rapidly sinking and then flowing out along the southern boundary between 150 and 350m. As it sinks and is transported, this water mass is transformed, mixing with surrounding Arabian Sea water. Here we present high resolution (2km / 3hr) observations of a section along the southern boundary of the Gulf of Oman during the winter (NE) and summer (SW) monsoons, and the spring intermonsoon. These data illustrate the high seasonal variability of dilution in Arabian Sea water and of flow out of the Gulf of Oman (0-3 Sv). We show the importance of both monsoonal and local eddy processes on defining the wide ranging properties of the PGW current where it detaches from the shelf edge, before flowing into the Arabian Sea.