Why is the water cold on the Namibian Coast?

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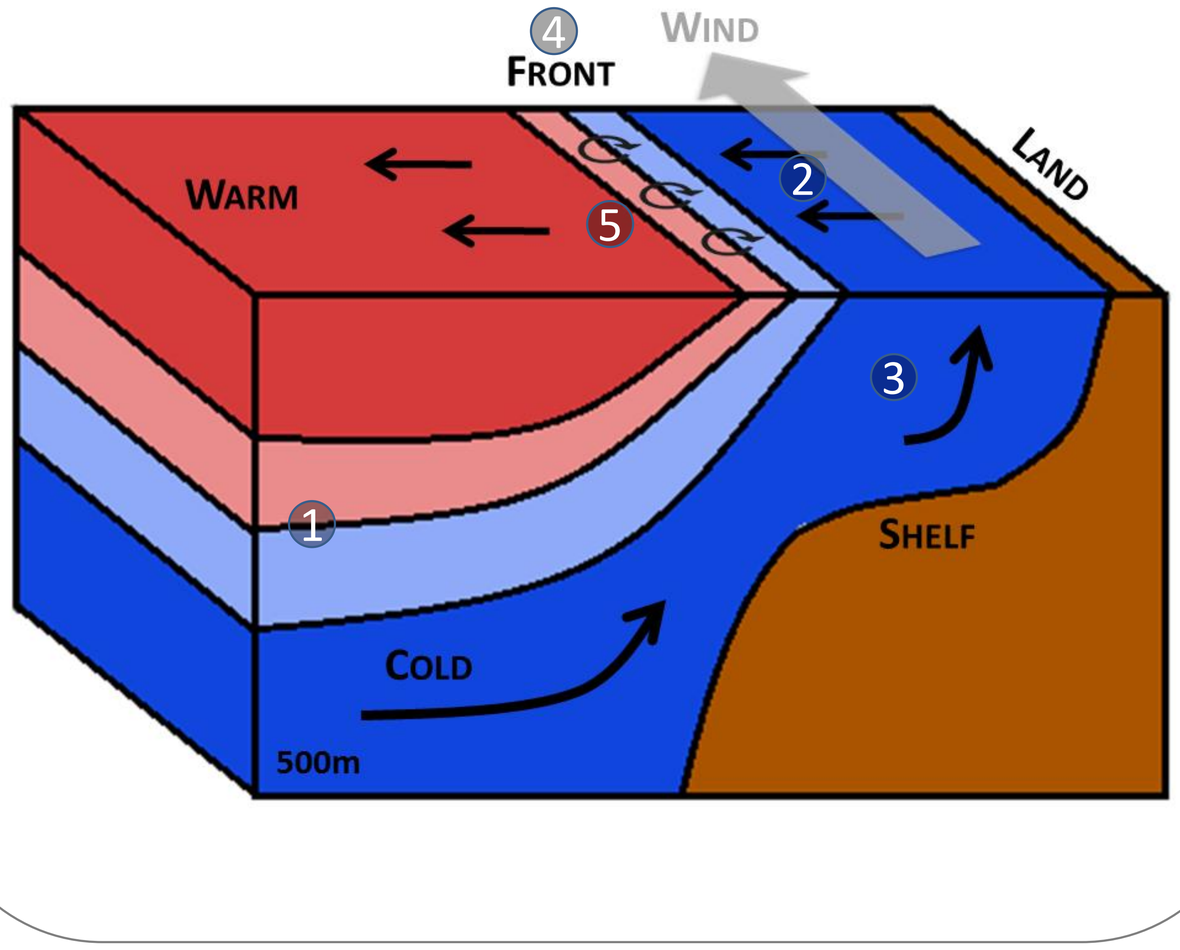
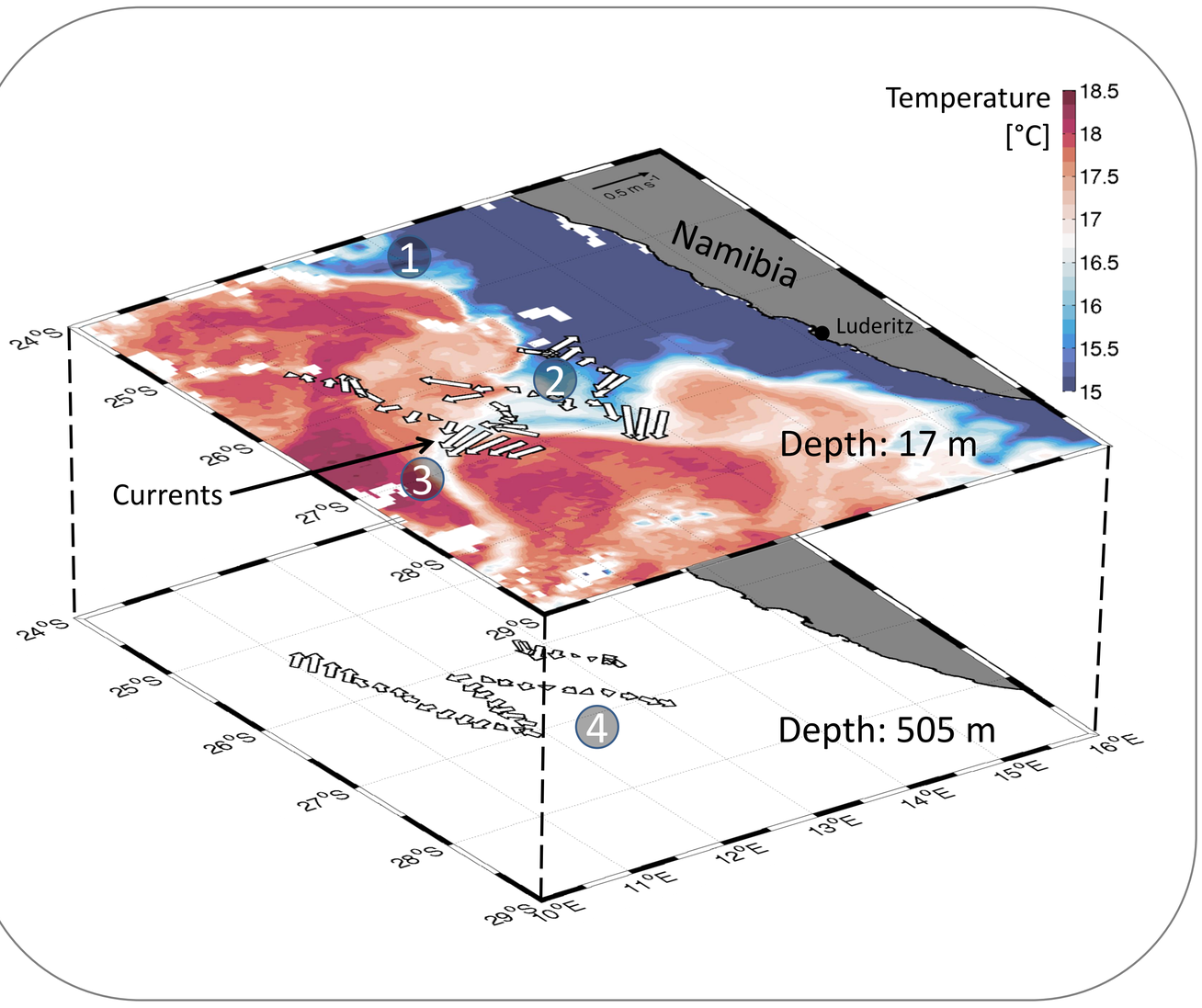


Upwelling brings cold water from the deep up to the surface along the coast.

1. Generally warm (fresh) water is lighter than cold (salty) water, which creates layers in the ocean.
2. A northward wind and the effects of the Earth's rotation transports warm surface water away from the coast.
3. To replace this lost water, cold water rises from below.
4. Because there is colder water along the coast and warmer water offshore a boundary is formed, called a front.
5. Along the fronts, the colder water mixes with the warmer water.



Measurements show the upwelling process is actually more complicated.

1. Satellite images of surface water temperature show the front is very irregular in strength, position and time.
2. These irregularities contribute to filaments, which are fingers of cold, but less salty water extending further offshore.
3. Currents are stronger within the filament, resulting in greater transport of water away from the coast.
4. Currents in the filaments are strongest at the surface, and weaken with depth.

Our research aims to improve our understanding of these small- and large-scale processes including upwelling, filaments, and fronts. This knowledge will help advance global ocean models, which in turn are essential for accurate climate model predictions.

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