

Complex features at the ocean surface

- The cold upwelling water front off Namibia's coast in the area of Lüderitz does not have a regular form because of the existence of eddies and so called filaments.
- Filaments are finger-like structures of cold upwelling water pushing west into the warm surface water offshore.
- They are of great importance for the transport of e.g. heat, nutrients, plankton biomass and suspended matters and thereby for the coastal ecosystem.

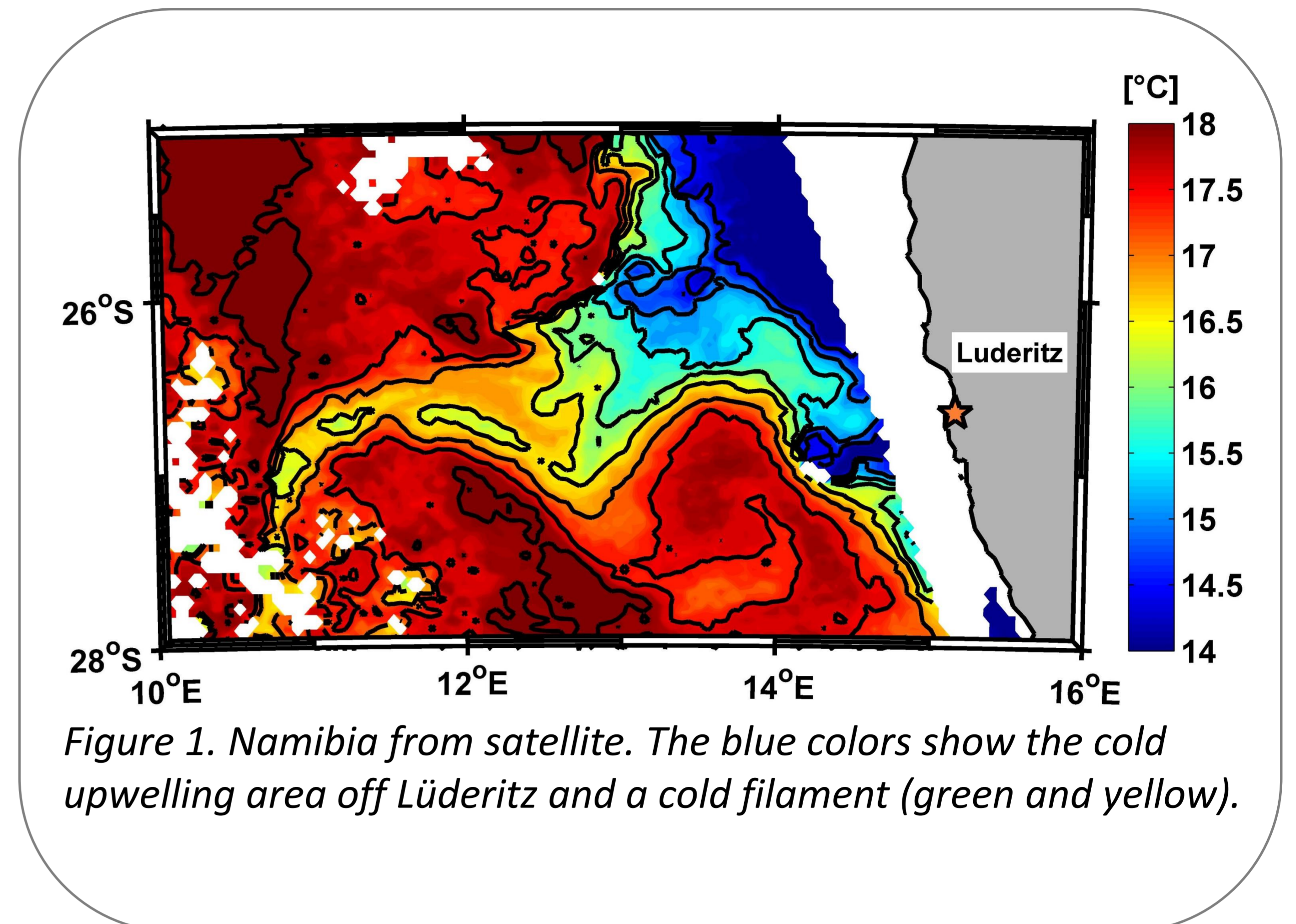


Figure 1. Namibia from satellite. The blue colors show the cold upwelling area off Lüderitz and a cold filament (green and yellow).



Figure 2. Left: Drifter right after deployment with drogue still folded. Right: Drifter (a) with unfolded drogue (b).

Instruments

- We explore the ocean surface currents by means of drifters, which follow the complex motions close to the surface for several months.
- The drifters utilize a satellite system to transmit their position and temperature every 30 min.
- By means of their drogue (a bag below the drifter) they monitor currents at 15 m depth.

Trajectories of drifters in the ocean

- We release the drifters in triplets, i.e. 3 drifters form a triangle with a distance of 100 m - 200 m between them.
- Depending on the position of release, the drifters have different trajectories (Figure 3):
 - The 4 drifter triplets (i.e. 12 drifters) released at the southern border of a filament (●) follow the structure of the filament for more than 2 weeks.
 - The drifters of the other 4 triplets released at the northern border (●) of the filament rapidly separate from each other and follow distinct paths within the complex surface currents.

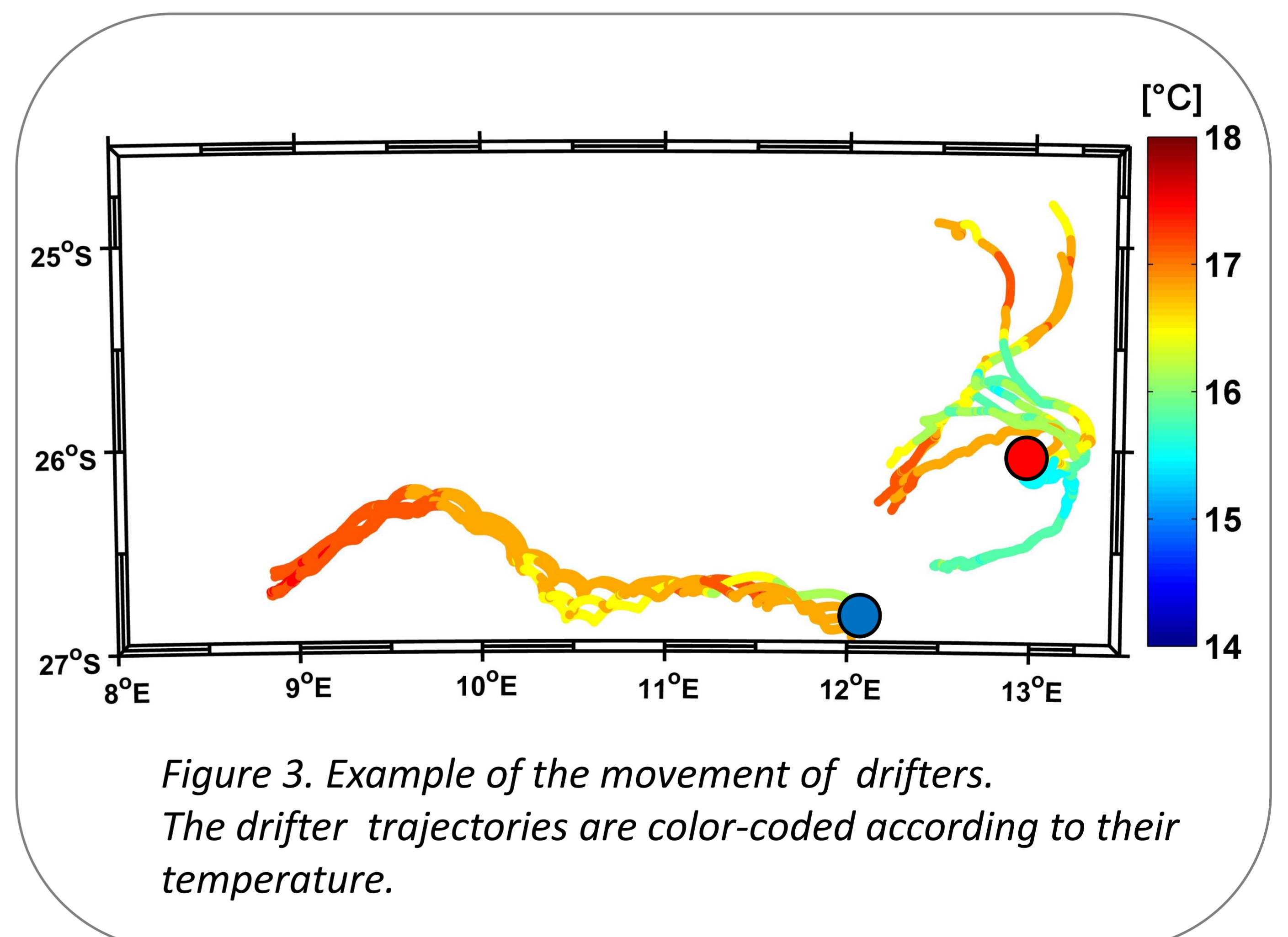


Figure 3. Example of the movement of drifters. The drifter trajectories are color-coded according to their temperature.

Analyzing single drifter trajectories yields information on the filament itself (e.g. mean velocities), and the temporal development of the relative separation between the drifters gives valuable insight into mixing processes within the filament and offshore areas.